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COMPARAÇÃO DE SOLUÇÕES NUMÉRICAS NA SIMULAÇÃO DIGITAL DA DINÂMICA DE DESTILAÇÃO MULTICOMPONENTE

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APÊNDICE A

LISTAGENS DE PROGRAMAS PARA REGIME PERMANENTE

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AA - Listagem do Programa para o Exemplo III.1.A

Formato A 4 - 210x297 mm

```
 FORTRAN IV, CD22546.004,    JUL   1967                                                    A 00010
$JOB      NOLIST                                                                         A 00020
$FORTRAN                                                                                 A 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)                        A 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)                   A 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)                 A 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)                    A 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                              A 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                             A 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                            A 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD                A 00110
      COMMON    HBALOK,PHI                                                             A 00120
      COMMON    SUMFD                                                                  A 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L               A 00140
      COMMON    NOV(30)                                                                A 00150
      DATA  NOV/01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,                 A 00160
     1              19,20,21,22,23,24,25,26,27,28,29,30/                               A 00170
C                                                                                        A 00180
C IF THE PROGRAM IS TO BE CHANGED TO ADD MORE COMPONENTS ,  NOTE MAXIMUM                 A 00190
C  NO OF COMPONENTS IS LIMITED BY COMPUTATIONS USING TS(I+60) TO 20                      A 00200
C                                                                                        A 00210
C      NOV 1  DATA                                                                       A 00220
C          2  DOUT                                                                       A 00230
C          3  INIT                                                                       A 00240
C          4  PLATE                                                                      A 00250
C          5  BOTUP                                                                      A 00260
C          6  TOPDN                                                                      A 00270
C          7  PHEE                                                                       A 00280
C          8  CPLAT                                                                      A 00290
C          9  PDSUM                                                                     A 00300
C         10  WROUT                                                                     A 00310
C         11  TCORR                                                                     A 00320
C         12  ENTH                                                                      A 00330
C         13  FLOCA                                                                     A 00340
C         14  FLOCB                                                                     A 00350
C         15  BUBPT                                                                     A 00360
C         16  DEWPT                                                                     A 00370
C                                                                                        A 00380
C                                                                                        A 00390
      NIC = 10                                                                           A 00400
      NIW = 10                                                                           A 00410
 1000 CONTINUE                                                                           A 00420
C       DO NEW SET OF DATA                                                               A 00430
      WRITE   (NIW,1001)                                                                 A 00440
 1001 FORMAT   (1H1)                                                                     A 00450
      CALL OVRLAY (NOV(01))                                                              A 00460
      CALL DATA                                                                          A 00470
      CALL OVRLAY (NOV(02))                                                              A 00480
      CALL DOUT                                                                          A 00490
      CALL OVRLAY (NOV(03))                                                              A 00500
      CALL INIT                                                                          A 00510
   15 CONTINUE                                                                           A 00520
      DO  35  I=1,L                                                                      A 00530
      NPT = 0                                                                            A 00540
      CALL OVRLAY (NOV(04))                                                              A 00550
      CALL PLATE(I)                                                                      A 00560
      IF  (NPT)  28, 1002, 1002                                                          A 00570
 1002 CONTINUE                                                                           A 00580
      CALL OVRLAY (NOV(05))                                                              A 00590
      CALL BOTUP(I)
```

```
      GO TO  35                                                          A 00600
   28 CONTINUE                                                           A 00610
      CALL OVRLAY (NOV(06))                                              A 00620
      CALL TOPDN(I)                                                      A 00630
   35 CONTINUE                                                           A 00640
      CALL OVRLAY (NOV(07))                                              A 00650
      CALL PHEE                                                          A 00660
      CALL OVRLAY (NOV(08))                                              A 00670
      CALL CPLAT                                                         A 00680
      CALL OVRLAY (NOV(09))                                              A 00690
      CALL PDSUM                                                         A 00700
      CALL OVRLAY (NOV(10))                                              A 00710
      CALL WROUT                                                         A 00720
      IF (ICON)  107, 1000, 98                                           A 00730
   98 CONTINUE                                                           A 00740
      CALL OVRLAY (NOV(11))                                              A 00750
      CALL TCORR                                                         A 00760
      CALL OVRLAY (NOV(12))                                              A 00770
      CALL ENTH                                                          A 00780
  107 CONTINUE                                                           A 00790
      CALL OVRLAY (NOV(13))                                              A 00800
      CALL FLOCA                                                         A 00810
      CALL OVRLAY (NOV(14))                                              A 00820
      CALL FLOCB                                                         A 00830
      GO TO  15                                                          A 00840
      END                                                                A 00850
```

```
$FORTRAN                                                          B 00010
      FUNCTION   EQUILK (A,B,C,D,T)                               B 00020
      EQUILK = EXP(A/(T+460.0)+B+C*(T+460.0))                     B 00030
      RETURN                                                      B 00040
      END                                                         B 00050
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
$FORTRAN                                                        C 00010
      FUNCTION    THALP (A,B,C,T)                               C 00020
      THALP = A*T + B                                           C 00030
      RETURN                                                    C 00040
      END                                                       C 00050
```

```
$OVERLAY     A                                                                  D 00010
$FORTRAN                                                                        D 00020
      SUBROUTINE  DATA                                                          D 00030
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)              D 00040
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)         D 00050
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)       D 00060
      COMMON    FD(23), ERRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)           D 00070
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                    D 00080
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                    D 00090
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                   D 00100
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD       D 00110
      COMMON     HBALOK,PHI                                                    D 00120
      COMMON     SUMFD                                                         D 00130
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L      D 00140
      COMMON     NOV(30)                                                       D 00150
      DIMENSION    NICHTS(380)                                                D 00160
    3 FORMAT    (5I3)                                                         D 00170
      READ     (NIC,3)    L,M,M1,M2,N                                        D 00180
      JT = M+M1+M2+N+1                                                       D 00190
      JC = JT+1                                                              D 00200
      JD = JC+1                                                              D 00210
      JMIN=JT-1                                                              D 00220
    4 FORMAT     (9F8.0)                                                     D 00230
      READ     (NIC,4)    (TEMP(J),J=1,JD)                                   D 00240
      READ     (NIC,4)    (VAPOR(J),J=1,JD)                                  D 00250
      READ     (NIC,4)    (QUID(J),J=1,JD)                                   D 00260
      READ     (NIC,4)    (FD1LIQ(I),I=1,L)                                  D 00270
      READ     (NIC,4)    (FD1VAP(I),I=1,L)                                  D 00280
      READ     (NIC,4)    (FD2LIQ(I),I=1,L)                                  D 00290
      READ     (NIC,4)    (FD2VAP(I),I=1,L)                                  D 00300
      READ     (NIC,4)    (FD3LIQ(I),I=1,L)                                  D 00310
      READ     (NIC,4)    (FD3VAP(I),I=1,L)                                  D 00320
    5 FORMAT    (4E20.0)                                                     D 00330
      READ     (NIC,5)   ((A(I,J),J=1,4),I=1,L)                             D 00340
      READ     (NIC,5)   ((EL(I,J),J=1,4),I=1,L)                            D 00350
      READ     (NIC,5)   ((EV(I,J),J=1,4),I=1,L)                            D 00360
      READ     (NIC,4)    FD1LIS,FD1VAS,FD2LIS,FD2VAS,FD3LIS,FD3VAS         D 00370
      READ     (NIC,4)    FD1LIH,FD1VAH,FD2LIH,FD2VAH,FD3LIH,FD3VAH         D 00380
      READ     (NIC,4)    PHIERR,SUMERR,BPERR                               D 00390
C       WHEN IS5 IS ZERO OR NEG   =  ONLY FINAL OUTPUT IS PRINTED            D 00400
      READ    (NIC,3)     IS5                                               D 00410
      RETURN                                                                 D 00420
      END                                                                    D 00430
```

```
$OVERLAY     A                                                                  E 00010
$FORTRAN                                                                        E 00020
      SUBROUTINE   DOUT                                                         E 00030
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)              E 00040
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)         E 00050
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)       E 00060
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)          E 00070
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FD=(23)                    E 00080
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                    E 00090
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                   E 00100
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD       E 00110
      COMMON     HBALOK,PHI                                                    E 00120
      COMMON     SUMFD                                                         E 00130
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L      E 00140
      COMMON     NOV(30)                                                       E 00150
    5 FORMAT    (48H1INPUT DATA FOR PROB. NO.          USING PROGRAM 1)        E 00160
      WRITE     (NIW,5)                                                       E 00170
    6 FORMAT    (116HONO. OF COMPONENTS     PLATES IN SECTION M     PLATE     E 00180
     1S IN SECTION M1     PLATES IN SECTION M2     PLATES IN SECTION N,/       E 00190
     2,I10,I23,I24,I25,I25)                                                     E 00200
      WRITE     (NIW,6)   L,M,M1,M2,N                                         E 00210
    7 FORMAT    (65H0FEED FLOWS AND ENTHALPIES IN ORDER OF LOWEST ENTERIN      E 00220
     1G TO HIGHEST,/,91HMOLES FEED LIQUID    MOLES FEED VAPOR    ENTHAL       E 00230
     2PY OF FEED LIQUID    ENTHALPY OF FEED VAPOR,/,(E16.8,E21.8,E23.6,E      E 00240
     327.8))                                                                    E 00250
      WRITE     (NIW,7)   FD1LIS,FD1LIH,FD1VAS,FD1VAH,FD2LIS,FD2LIH,          E 00260
     1                   FD2VAS,FD2VAH,FD3LIS,FD3LIH,FD3VAS,FD3VAH             E 00270
    8 FORMAT    (23H0COMPONENT FEED AMOUNTS,/,95H                LOWEST FE     E 00280
     1ED                  INTERMEDIATE FEED                    HIGHEST        E 00290
     2 FEED,/,98H         LIQUID            VAPOR            LIQUID           E 00300
     3    VAPOR            LIQUID            VAPOR,/,(6E17.8))                E 00310
      WRITE     (NIW,8)   (FD1LIQ(I),FD1VAP(I),FD2LIQ(I),FD2VAP(I),FD3LIQ(    E 00320
     1I),FD3VAP(I),I=1,L)                                                       E 00330
    9 FORMAT    (111H0EQUILIBRIUM CONSTANTS A      EQUILIBRIUM CONSTANTS B     E 00340
     1      EQUILIBRIUM CONSTANTS C      EQUILIBRIUM CONSTANTS D,/,            E 00350
     2  (E19.8,3E29.8))                                                        E 00360
      WRITE     (NIW,9)   ((A(I,J),J=1,4),I=1,L)                              E 00370
   10 FORMAT    (112H0ENTHALPY CONSTANTS A1      ENTHALPY CONSTANTS A2        E 00380
     1ENTHALPY CONSTANTS A3                              FOR LIQUID,/,         E 00390
     2 (E18.8,2E26.8))                                                        E 00400
      WRITE     (NIW,10)  ((EL(I,J),J=1,3),I=1,L)                             E 00410
 2010 FORMAT    (112H0ENTHALPY CONSTANTS A1      ENTHALPY CONSTANTS A2        E 00420
     1ENTHALPY CONSTANTS A3                              FOR VAPOR ,/,         E 00430
     2 (E18.8,2E26.8))                                                        E 00440
      WRITE     (NIW,2010)  ((EV(I,J),J=1,3),I=1,L)                           E 00450
   11 FORMAT    (62H0ERROR LIMIT ON PHI      ERROR LIMIT ON SUMMATION         E 00460
     1  ERROR LIMIT ON BUBBLE POINT,/,(E17.8,E25.8,E33.8))                     E 00470
      WRITE     (NIW,11)  PHIERR,SUMERR,BPERR                                 E 00480
   12 FORMAT    (55H0       TEMPERATURES        VAPOR FLOWS      LIQUID FLO    E 00490
     1WS,/,(3E19.8))                                                          E 00500
      WRITE     (NIW,12)  (TEMP(I),VAPOR(I),QUID(I),I=1,JD)                   E 00510
      IF (IS5) 1051,1051,1053                                                 E 00520
 1050 FORMAT    (26HUONLY FINAL OUTPUT PRINTED)                               E 00530
 1051 WRITE     (NIW,1050)                                                    E 00540
 1052 FORMAT    (41H0OUTPUT WILL BE GIVEN FOR EVERY ITERATION)                E 00550
 1053 WRITE     (NIW,1052)                                                    E 00560
      RETURN                                                                  E 00570
      END                                                                     E 00580
```

```
$OVERLAY     A                                                                  F 00010
$FORTRAN                                                                        F 00020
      SUBROUTINE  INIT                                                          F 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)               F 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)          F 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)        F 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), REBOT(6), RETOP(6)           F 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                     F 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                      F 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                     F 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD         F 00110
      COMMON    HBALOK,PHI                                                      F 00120
      COMMON    SUMFD                                                           F 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L        F 00140
      COMMON    NOV(30)                                                         F 00150
      SUBRT = 0.0                                                               F 00160
      CHECK = 0.0                                                               F 00170
      COUNT = 0.0                                                               F 00180
      TEST = 0.0                                                                F 00190
      ITERAT = 0                                                                F 00200
      CONDLD = 0.0                                                              F 00210
      REBLD = 0.0                                                               F 00220
      HBALOK = 1.0                                                              F 00230
      DO  13  J=1,JD                                                            F 00240
      VAPMOH(J) = 0.0                                                           F 00250
      QUIMOH(J) = 0.0                                                           F 00260
   13 CONTINUE                                                                  F 00270
      DO  14  I=1,L                                                             F 00280
      TS(I) =FD1LIQ(I)+FD1VAP(I)+FD2LIQ(I)+FD2VAP(I)+FD3LIQ(I)+FD3VAP(I)       F 00290
   14 CONTINUE                                                                  F 00300
      RETURN                                                                    F 00310
      END                                                                       F 00320
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
$OVERLAY     A                                                              G 00010
$FORTRAN                                                                    G 00020
      SUBROUTINE   PLATE(I)                                                 G 00030
      COMMON    GENX(6,23), SJM(23), TEMP(23), VAPOR(23), QUID(23)          G 00040
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)     G 00050
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)   G 00060
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)      G 00070
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                G 00080
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                 G 00090
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                G 00100
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD    G 00110
      COMMON     HBALOK,PHI                                                 G 00120
      COMMON     SUMFD                                                      G 00130
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L   G 00140
      COMMON     NOV(30)                                                    G 00150
                                                                            G 00160
C                                                                           G 00170
C CALCULATION OF PLATE COMPOSITIONS                                         G 00180
C                                                                           G 00190
      DO  16  J=1,JT                                                        G 00200
      SF(J)=VAPOR(J)*EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),TEMP(J))/QUID(J)    G 00210
      FD(J) = 0.0                                                           G 00220
   16 CONTINUE                                                              G 00230
      FD(JC) = 0.0                                                          G 00240
      J=M+1                                                                 G 00250
      FD(J) = FD1LIQ(I)*FD(J)                                               G 00260
      J = M + 2                                                             G 00270
      FD(J) = FD1VAP(I) + FD(J)                                             G 00280
      J = M + M1 + 1                                                        G 00290
      FD(J) = FD2LIQ(I) + FD(J)                                             G 00300
      J = M + M1 + 2                                                        G 00310
      FD(J) = FD2VAP(I) + FD(J)                                             G 00320
      J = M + M1 + M2 +1                                                    G 00330
      FD(J) = FD3LIQ(I) + FD(J)                                             G 00340
      J = M + M1 + M2 + 2                                                   G 00350
      FD(J) = FD3VAP(I) + FD(J)                                             G 00360
   17 ERRRAU = 1.0                                                          G 00370
      DO  18  J=1,JT                                                        G 00380
      ERRRAU = SF(J)*ERRRAU + 1.0                                           G 00390
      IF (1.0E20-ERRRAU) 28,28,18                                           G 00400
   18 CONTINUE                                                              G 00410
      ERRRAU = ERRRAU*QUID(JD)/QUID(JC)                                     G 00420
      ERRRAD = QUID(JC)/QUID(JD)                                            G 00430
      J = JC                                                                G 00440
      DO  19  K=1,JT                                                        G 00450
      ERRRAD = (ERRRAD+1.0)/SF(J-1)                                         G 00460
      IF (1.0E20-ERRRAD) 21,21,19                                           G 00470
   19 J = J-1                                                               G 00480
   20 IF (ERRRAU-ERRRAD) 21,21,28                                           G 00490
   21 NPT = 1                                                               G 00500
      RETURN                                                                G 00510
   28 NPT = -1                                                              G 00520
      RETURN                                                                G 00530
      END
```



```
$OVERLAY     A                                                                  H 00010
$FORTRAN                                                                        H 00020
      SUBROUTINE   BOTUP(I)                                                     H 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)               H 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)          H 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)        H 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)           H 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                     H 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                      H 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                     H 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD         H 00110
      COMMON    HBALOK,PHI                                                      H 00120
      COMMON    SUMFD                                                           H 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L        H 00140
      COMMON    NOV(30)                                                         H 00150
   21 GENX(I,1) = TS(I)                                                         H 00160
      SUMFD = 0.0                                                               H 00170
      ERRRAT(1) = 1.0                                                           H 00180
      DO  24  J=1,JT                                                            H 00190
      SUMFD = SUMFD + FD(J)                                                     H 00200
      ERRRAT(J+1) = SF(J)*ERRRAT(J) + 1.0                                       H 00210
      PROD = GENX(I,1) * SUMFD                                                  H 00220
      IF (PROD) 22,22,23                                                        H 00230
   22 GENX(I,J+1) = SF(J)*GENX(I,J)+1.0E-20                                     H 00240
      GO TO 24                                                                  H 00250
   23 GENX(I,J+1) = SF(J)*GENX(I,J) + PROD + 1.0E-20                            H 00260
   24 CONTINUE                                                                  H 00270
      ERRRAT(JD) = ERRRAT(JC)*QUID(JD)/QUID(JC)                                 H 00280
      GENX(I,JD) = GENX(I,JC)*QUID(JD)/QUID(JC)                                 H 00290
      ERRBOT = GENX(I,JD)/(ERRRAT(JD)+1.0)                                      H 00300
      DO -27  J=1,JD                                                            H 00310
      GENXN = (GENX(I,J)-ERRRAT(J)*ERRBOT)/QUID(J)                              H 00320
      IF (GENXN) 25,25,26                                                       H 00330
   25 GENX(I,J) = SF(J-1)*QUID(J-1)*GENX(I,J-1)/QUID(J)+1.0E-20                 H 00340
      IF ((J-1 .LE. 0) .OR. (J-1 .GE. JC))  GO TO 1110                          H 00350
      GO TO 27                                                                  H 00360
 1110 WRITE   (NIW,1009) J - 1                                                  H 00370
      WRITE   (NIW,1009) J - 1                                                  H 00380
 1009 FORMAT   (1H1, 20(1H*), 22H VORSICHT BOTUP J-1 = , I5, 20(1H*))          H 00390
      GO TO 27                                                                  H 00400
   26 GENX(I,J) = GENXN + 1.0E-20                                               H 00410
   27 CONTINUE                                                                  H 00420
      GO TO 35                                                                  H 00430
   35 RETURN                                                                    H 00440
      END                                                                       H 00450
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

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$OVERLAY     A                                                                  I 00010
$FORTRAN                                                                        I 00020
      SUBROUTINE  TOPDN(I)                                                      I 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)               I 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)          I 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)        I 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)           I 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                     I 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                      I 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                     I 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD         I 00110
      COMMON    HBALOK,PHI                                                      I 00120
      COMMON    SUMFD                                                           I 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L        I 00140
      COMMON    NOV(30)                                                         I 00150
   28 SUMFD = 0.0                                                               I 00160
      GENX(I,JD) = TS(I)                                                        I 00170
      GENX(I,JC) = GENX(I,JD)*QUID(JC)/QUID(JD)                                 I 00180
      ERRRAT(JC) = QUID(JC)/QUID(JD)                                            I 00190
      J = JC                                                                    I 00200
      DO  31  K=1,JT                                                            I 00210
      SUMFD = SUMFD + FD(J)                                                     I 00220
      ERRRAT(J-1) = (ERRRAT(J) + 1.0)/SF(J-1)                                   I 00230
      PROD = GENX(I,JD) - SUMFD                                                 I 00240
      IF (PROD) 29,29,30                                                        I 00250
   29 GENX(I,J-1) = GENX(I,J)/SF(J-1) + 1.0E-20                                 I 00260
      GO TO 31                                                                  I 00270
   30 GENX(I,J-1) = (GENX(I,J) + PROD)/SF(J-1) + 1.0E-20                        I 00280
   31 J = J-1                                                                   I 00290
      ERRTOP = GENX(I,1)/(ERRRAT(1) + 1.0)                                      I 00300
      GENX(I,JD) = (GENX(I,JD)-ERRTOP)/QUID(JD)                                 I 00310
      J = JC                                                                    I 00320
      DO  34  K=1,JC                                                            I 00330
      GENXN = (GENX(I,J)-ERRRAT(J)*ERRTOP)/QUID(J)                              I 00340
      IF (GENXN) 32,32,33                                                       I 00350
   32 GENX(I,J) = (QUID(J+1)*GENX(I,J+1))/SF(J)/QUID(J) + 1.0E-20               I 00360
      IF (J .GE. JC)  GO TO 1100                                                I 00370
      GO TO 34                                                                  I 00380
 1100 WRITE    (NIW,1010) J                                                     I 00390
 1010 FORMAT    (1H1, 20(1H*), 25H CAREFUL TOPDN, J =      ,I5, 25(1H*))       I 00400
      GO TO 34                                                                  I 00410
   33 GENX(I,J) = GENXN + 1.0E-20                                               I 00420
   34 J = J - 1                                                                 I 00430
   35 CONTINUE                                                                  I 00440
      RETURN                                                                    I 00450
      END                                                                       I 00460
```

```
$OVERLAY     A                                                              J 00010
$FORTRAN                                                                    J 00020
      SUBROUTINE  PHEE                                                      J 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)           J 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)      J 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)    J 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)       J 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                 J 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                  J 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                 J 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD     J 00110
      COMMON    HBALOK,PHI                                                  J 00120
      COMMON    SUMFD                                                       J 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L    J 00140
      COMMON    NOV(30)                                                     J 00150
C                                                                           J 00160
C CALCULATION OF PHI                                                        J 00170
C                                                                           J 00180
C                                                                           J 00190
      DO  36  I=1,L                                                         J 00200
   36 TS(I+20) = GENX(I,1)/GENX(I,JD)                                       J 00210
      KTIMES = 1                                                            J 00220
      PHI = 1.0                                                             J 00230
      PHIP = PHI                                                            J 00240
   37 SUMXD = 0.0                                                           J 00250
      DO  38  I=1,L                                                         J 00260
      TS(I+40) = TS(I)/(QUID(1)*TS(I+20)*PHI+ QUID(JD))                     J 00270
      TS(I+60) = TS(I)/(QUID(JD)/(TS(I+20)*PHI) + QUID(1))                  J 00280
      SUMXD = SUMXD + TS(I+40)                                              J 00290
   38 CONTINUE                                                              J 00300
      IF (ABS(SUMXD-1.0)-PHIERR) 44,44,39                                   J 00310
   39 KTIMES = KTIMES - 1                                                   J 00320
      IF (KTIMES) 41,40,40                                                  J 00330
   40 SUMXDO = SUMXD                                                        J 00340
      PHIO = PHI                                                            J 00350
      PHI = 0.9                                                             J 00360
      GO TO 37                                                              J 00370
   41 SLOPE = (SUMXD-SUMXDO)/(PHI-PHIO)                                     J 00380
      PHIN = ((1.0-SUMXD)/SLOPE) + PHI                                      J 00390
      SUMXDO = SUMXD                                                        J 00400
      PHIO = PHI                                                            J 00410
      IF (PHIN) 42,42,43                                                    J 00420
   42 PHI = 0.9*PHI                                                         J 00430
      GO TO 37                                                              J 00440
   43 PHI = PHIN                                                            J 00450
      GO TO 37                                                              J 00460
   44 IF (TEST) 49,49,45                                                    J 00470
   45 IF ((PHI-1.0)*(PHIP-1.0)) 46,47,47                                    J 00480
   46 COUNT = COUNT + 1.0                                                   J 00490
      GO TO 49                                                              J 00500
   47 COUNT = COUNT - 1.0                                                   J 00510
      IF (COUNT) 48,49,49                                                   J 00520
   48 COUNT = 0.0                                                           J 00530
   49 TEST = TEST + 1.0                                                     J 00540
      RETURN                                                                J 00550
      END                                                                   J 00560
```

```
$OVERLAY     A                                                              K 00010
$FORTRAN                                                                    K 00020
      SUBROUTINE  CPLAT                                                     K 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)           K 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)      K 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)    K 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)       K 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                 K 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                  K 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                 K 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD     K 00110
      COMMON    HBALOK,PHI                                                  K 00120
      COMMON    SUMFD                                                       K 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L    K 00140
      COMMON    NOV(30)                                                     K 00150
C                                                                           K 00160
C CORRECTION OF PLATE COMPOSITIONS                                          K 00170
C                                                                           K 00180
      DO  69  I=1,L                                                         K 00190
      IF (FD3VAP(I)+FD3LIQ(I)) 51,51,50                                     K 00200
   50 KP = N                                                                K 00210
      GO TO 54                                                              K 00220
   51 IF (FD2VAP(I) + FD2LIQ(I)) 53,53,52                                   K 00230
   52 KP = N+M2                                                             K 00240
      GO TO 54                                                              K 00250
   53 KP = N + M2 + M1                                                      K 00260
   54 RATIO = (TS(I+40)/GENX(I,JD)+COUNT)/(COUNT + 1.0)                     K 00270
      IF (ABS(RATIO-1.0)-1.0E-06) 59,59,55                                  K 00280
   55 FACTOR = RATIO**(1.0/FLOAT(KP+1))                                     K 00290
      J = JT                                                                K 00300
      DO  58  K=1,KP                                                        K 00310
      RATIO = RATIO/FACTOR                                                  K 00320
      GENXN = GENX(I,J)*RATIO                                               K 00330
      IF (GENXN-1.0) 56,56,57                                               K 00340
   56 GENX(I,J) = GENXN                                                     K 00350
      GO TO 58                                                              K 00360
   57 GENX(I,J) = 1.0                                                       K 00370
   58 J = J-1                                                               K 00380
   59 IF (FD1LIQ(I)+FD1VAP(I)) 61,61,60                                     K 00390
   60 KP = M                                                                K 00400
      GO TO 64                                                              K 00410
   61 IF (FD2LIQ(I) + FD2VAP(I)) 63,63,62                                   K 00420
   62 KP = M + M1                                                           K 00430
      GO TO 64                                                              K 00440
   63 KP = M + M1 + M2                                                      K 00450
   64 RATIO = (TS(I+60)/GENX(I,1) + COUNT)/(COUNT+1.0)                      K 00460
      IF (ABS(RATIO-1.0)-1.0E-6) 69,69,65                                   K 00470
   65 FACTOR = RATIO**(1.0/FLOAT(KP+1))                                     K 00480
      J = 2                                                                 K 00490
      DO  68  K=1,KP                                                        K 00500
      RATIO = RATIO/FACTOR                                                  K 00510
      GENXN = GENX(I,J)*RATIO                                               K 00520
      IF (GENXN-1.0) 66,66,67                                               K 00530
   66 GENX(I,J) = GENXN                                                     K 00540
      GO TO 68                                                              K 00550
   67 GENX(I,J) = 1.0                                                       K 00560
   68 J = J+1                                                               K 00570
   69 CONTINUE                                                              K 00580
      RETURN                                                                K 00590
```

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END                                                          K 00600
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$OVERLAY     A                                                                  L 00010
                                                                                L 00020
$FORTRAN                                                                        L 00030
      SUBROUTINE  PDSUM                                                         L 00040
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)              L 00050
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)         L 00060
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)       L 00070
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)          L 00080
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                    L 00090
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                     L 00100
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                    L 00110
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD        L 00120
      COMMON     RBALOK,PHI                                                     L 00130
      COMMON     SUMFD                                                          L 00140
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L       L 00150
      COMMON     NOV(30)                                                        L 00160
C                                                                               L 00170
C PRODUCT AMOUNTS     RECOVERY FRACTIONS      SUMMMATIONS                       L 00180
C                                                                               L 00190
      SUMFD = 0.0                                                               L 00200
      DO  70  I=1,L                                                             L 00210
      SUMFD = SUMFD + TS(I)                                                     L 00220
      GENX(I,JD) = TS(I+40)                                                     L 00230
      GENX(I,JC) = TS(I+40)                                                     L 00240
      GENX(I,1) = TS(I+60)                                                      L 00250
      TOPP(I) = QUID(JD)*TS(I+40)                                               L 00260
      RFTOP(I) = TOPP(I)/TS(I)                                                  L 00270
      BOTP(I) = QUID(1)*TS(I+60)                                                L 00280
      RFBOT(I) = BOTP(I)/TS(I)                                                  L 00290
   70 CONTINUE                                                                  L 00300
      DO  71  J=1,JD                                                            L 00310
      SUM(J) = 0.0                                                              L 00320
      DO  71  I=1,L                                                             L 00330
      SUM(J) = SUM(J) + GENX(I,J)                                               L 00340
   71 CONTINUE                                                                  L 00350
      RETURN                                                                    L 00360
      END
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$OVERLAY     A                                                                  M 00010
$FORTRAN                                                                        M 00020
      SUBROUTINE   WROUT                                                        M 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)               M 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)          M 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)        M 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)           M 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                     M 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                      M 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                     M 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD         M 00110
      COMMON    HBALOK,PHI                                                      M 00120
      COMMON    SUMFD                                                           M 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L        M 00140
      COMMON    NOV(30)                                                         M 00150
C                                                                               M 00160
C OUTPUT                                                                        M 00170
C                                                                               M 00180
      ICON = 100                                                                M 00190
      ITERAT = ITERAT + 1                                                       M 00200
      IF (IS5) 72,72,75                                                         M 00210
   72 DO  73  J=1,JD                                                            M 00220
      IF (ABS(SUM(J)-1.0)-SUMERR+HBALOK) 73,73,98                               M 00230
   73 CONTINUE                                                                  M 00240
   74 FORMAT   (12H1PROBLEM NO.,/,17H0ITERATION NO. = ,I3,/,53H0LIQUID M        M 00250
     1OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)                             M 00260
   75 WRITE    (NIW,74)   ITERAT                                                M 00270
   76 FORMAT    (21H0       BOTTOM PRODUCT,/,(5E20.8))                          M 00280
      WRITE    (NIW,76)   (GENX(I,1),I=1,L)                                     M 00290
      JPLATE = 0                                                                M 00300
      DO  78  J=2,JT                                                            M 00310
      JPLATE = JPLATE+1                                                         M 00320
   77 FORMAT    (19H0       PLATE NO. = ,I3,/,(5E20.8))                         M 00330
      WRITE    (NIW,77)   JPLATE,(GENX(I,J),I=1,L)                              M 00340
   78 CONTINUE                                                                  M 00350
   79 FORMAT    (13H0       REFLUX, /,(5E20.8))                                 M 00360
      WRITE    (NIW,79)   (GENX(I,JC),I=1,L)                                    M 00370
   80 FORMAT    (18H0       TOP PRODUCT,/,(5E20.8))                             M 00380
      WRITE    (NIW,80)   (GENX(I,JD),I=1,L)                                    M 00390
   81 FORMAT    (34H0BOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))               M 00400
      WRITE    (NIW,81)   (RFBOT(I),I=1,L)                                      M 00410
   82 FORMAT    (31H0TOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))                  M 00420
      WRITE    (NIW,82)   (RFTOP(I),I=1,L)                                      M 00430
   83 FORMAT    (27H0MOLES OF FEED AND PRODUCTS)                                 M 00440
      WRITE    (NIW,83)                                                         M 00450
   84 FORMAT    (70H0      COMPONENT          FEED          BOTTOM PRODUCT      M 00460
     1      TOP PRODUCT,/,(I11,E22.8,2E19.8))                                  M 00470
      WRITE    (NIW,84)   (I,TS(I),BOTP(I),TOPP(I),I=1,L)                       M 00480
   85 FORMAT    (2H  ,/,E33.8,2E19.8)                                            M 00490
      WRITE    (NIW,85)   SUMFD,QUID(1),QUID(JD)                                M 00500
   86 FORMAT    (16H0PLATE VARIABLES)                                            M 00510
      WRITE    (NIW,86)                                                         M 00520
   87 FORMAT    (115H0        SUMMATIONS          TEMPERATURES        VAPOR F   M 00530
     1LOWS          LIQUID FLOWS    VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,    M 00540
     2 (6E19.8))                                                                M 00550
      WRITE    (NIW,87)   (SUM(J),TEMP(J),VAPOR(J),QUID(J),VAPMOH(J),          M 00560
     1                    QUIMOH(J),J=1,JD)                                     M 00570
   88 FORMAT    (18H0CONDENSER LOAD = ,E15.8,/,17H0REBOILER LOAD = ,E15.8       M 00580
     1,/,7H0PHI = ,E15.8)                                                       M 00590
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cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

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      WRITE   (NIW,88)   CONDLD,REBLD,PHI                                  M 00600
      DO  89  J=1,JD                                                       M 00610
      IF (ABS(SUM(J)-1.0)-SUMERR+HBALOK) 89,89,98                          M 00620
   89 CONTINUE                                                             M 00630
      ICON = 0                                                             M 00640
      RETURN                                                               M 00650
   98 ICON = 1                                                             M 00660
      RETURN                                                               M 00670
C      IF RETURNING FROM A CONTROL SUBROUTINE SET ICON = -1                M 00680
      END                                                                  M 00690
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$OVERLAY     A                                                                  N 00010
$FORTRAN                                                                        N 00020
      SUBROUTINE   TCORR                                                        N 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)               N 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)          N 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)        N 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)           N 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                     N 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                      N 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                     N 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD         N 00110
      COMMON    HBALOK,PHI                                                      N 00120
      COMMON    SUMFD                                                           N 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L        N 00140
      COMMON    NOV(30)                                                         N 00150
C                                                                               N 00160
C CORRECTION OF TEMPERATURES                                                    N 00170
C                                                                               N 00180
      CALL OVRLAY (NOV(15))                                                     N 00190
   98 DO  99  J=1,JC                                                            N 00200
      DO  99  I=1,L                                                             N 00210
      GENX(I,J) = GENX(I,J)/SUM(J)                                              N 00220
   99 CONTINUE                                                                  N 00230
      DO  100 I=1,L                                                             N 00240
  100 QUIDX(I) = GENX(I,1)                                                      N 00250
      CALL BUBPT (QUIDX,TEMP(1),A,L,BPERR)                                      N 00260
      DO  102  J=2,JT                                                           N 00270
      T = TEMP(J)                                                               N 00280
      DO  101  I=1,L                                                            N 00290
  101 QUIDX(I) = GENX(I,J)                                                      N 00300
      CALL BUBPT (QUIDX,T,A,L,BPERR)                                            N 00310
      TEMP(J) = (COUNT*TEMP(J)+T)/(COUNT+1.0)                                   N 00320
  102 CONTINUE                                                                  N 00330
      DO  103  I=1,L                                                            N 00340
      QUIDX(I) = GENX(I,JC)                                                     N 00350
  103 CONTINUE                                                                  N 00360
      CALL BUBPT (QUIDX,TEMP(JC),A,L,BPERR)                                     N 00370
      TEMP(JD) = TEMP(JC)                                                       N 00380
      RETURN                                                                    N 00390
      END                                                                       N 00400
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
$OVERLAY     A                                                                  O 00010
$FORTRAN                                                                        O 00020
      SUBROUTINE   ENTH                                                         O 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)               O 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)          O 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)        O 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)           O 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                     O 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2_IH,FD3LIH                      O 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                     O 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD         O 00110
      COMMON    HBALOK,PHI                                                      O 00120
      COMMON    SUMFD                                                           O 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L        O 00140
      COMMON    NOV(30)                                                         O 00150
C                                                                               O 00160
C CALCULATION OF  MOLAL ENTHALPIES                                              O 00170
C                                                                               O 00180
      DO  105  J=1,JT                                                           O 00190
      VAPMOH(J) = 0.0                                                           O 00200
      QUIMOH(J) = 0.0                                                           O 00210
      SUMY = 0.0                                                                O 00220
      DO  104  I=1,L                                                            O 00230
      SUMY = SUMY+ GENX(I,J)*EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),TEMP(J))        O 00240
      VAPMOH(J) = VAPMOH(J) + THALP(EV(I,1),EV(I,2),EV(I,3),TEMP(J))*GEN        O 00250
     1X(I,J)*EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),TEMP(J))                        O 00260
      QUIMOH(J) = QUIMOH(J) + THALP(EL(I,1),EL(I,2),EL(I,3),TEMP(J))*           O 00270
     1  GENX(I,J)                                                              O 00280
  104 CONTINUE                                                                  O 00290
      VAPMOH(J) = VAPMOH(J)/SUMY                                                O 00300
  105 CONTINUE                                                                  O 00310
      QUIMOH(JC) = 0.0                                                          O 00320
      DO  106  I=1,L                                                            O 00330
      QUIMOH(JC) = QUIMOH(JC) + THALP(EL(I,1),EL(I,2),EL(I,3),TEMP(JC))*        O 00340
     1   GENX(I,JC)                                                           O 00350
  106 CONTINUE                                                                  O 00360
      QUIMOH(JD) = QUIMOH(JC)                                                   O 00370
      RETURN                                                                    O 00380
      END                                                                       O 00390
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
$OVERLAY     A                                                                  P 00010
$FORTRAN                                                                        P 00020
      SUBROUTINE   FLOCA                                                        P 00030
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)              P 00040
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)         P 00050
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)       P 00060
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)          P 00070
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)                    P 00080
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                     P 00090
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                    P 00100
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD        P 00110
      COMMON     HBALOK,PHI                                                     P 00120
      COMMON     SUMFD                                                          P 00130
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L       P 00140
      COMMON     NOV(30)                                                        P 00150
C                                                                               P 00160
C CORRECTION OF FLOWS                                                           P 00170
C                                                                               P 00180
C                                                                               P 00190
  107 DO  108  J=1,JC                                                           P 00200
      FD(J) = 0.0                                                               P 00210
  108 FDH(J) = 0.0                                                              P 00220
      J = M+1                                                                   P 00230
      FD(J) = FD1LIS + FD(J)                                                    P 00240
      FDH(J) = FD1LIH + FDH(J)                                                  P 00250
      J = M+2                                                                   P 00260
      FD(J) = FD1VAS + FD(J)                                                    P 00270
      FDH(J) = FD1VAH + FDH(J)                                                  P 00280
      J = M + M1 + 1                                                            P 00290
      FD(J) = FD2LIS + FD(J)                                                    P 00300
      FDH(J) = FD2LIH + FDH(J)                                                  P 00310
      J = M + M1 + 2                                                            P 00320
      FD(J) = FD2VAS + FD(J)                                                    P 00330
      FDH(J) = FD2VAH + FDH(J)                                                  P 00340
      J = M + M1 + M2 + 1                                                       P 00350
      FD(J) = FD3LIS + FD(J)                                                    P 00360
      FDH(J) = FD3LIH + FDH(J)                                                  P 00370
      J = M + M1 + M2 + 2                                                       P 00380
      FD(J) = FD3VAS + FD(J)                                                    P 00390
      FDH(J) = FD3VAH + FDH(J)                                                  P 00400
      VAPOR(JT) = QUID(JD) + QUID(JC) - FD(JC)                                  P 00410
      DO  109  I=1,L                                                            P 00420
  109 TS(I+20) = 0.0                                                            P 00430
      IF (FD(JC)) 117,117,110                                                   P 00440
  110 DO  111  I=1,L                                                            P 00450
  111 TS(I+20) = FD1VAP(I)                                                      P 00460
      IF (FD2VAS) 114,114,112                                                   P 00470
  112 DO  113  I=1,L                                                            P 00480
  113 TS(I+20) = FD2VAP(I)                                                      P 00490
  114 IF (FD3VAS) 117,117,115                                                   P 00500
  115 DO  116  I=1,L                                                            P 00510
  116 TS(I+20) = FD3VAP(I)                                                      P 00520
  117 DO  118  I=1,L                                                            P 00530
      VAPY(I) = (QUID(JD)*GENX(I,JD) + QUID(JC)*GENX(I,JC) - TS(I+20))/         P 00540
     1 VAPOR(JT)                                                                P 00550
  118 CONTINUE                                                                  P 00560
      CALL OVRLAY (NOV(16))                                                     P 00570
      CALL DEWPT (VAPY,TEMP(JT),A,L,BPERR)                                      P 00580
      VAPMOH(JT) = 0.0                                                          P 00590
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
      DO  119  I=1,L                                                        P 00600
      VAPMOH(JT) = VAPMOH(JT) + VAPY(I)*THALP(EV(I,1),EV(I,2),EV(I,3),TE   P 00610
     1MP(JT))                                                               P 00620
  119 CONTINUE                                                              P 00630
      RETURN                                                                P 00640
      END                                                                   P 00650
```

```
$OVERLAY     A                                                                  Q 00010
$FORTRAN                                                                        Q 00020
      SUBROUTINE   FLOCB                                                        Q 00030
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)               Q 00040
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)          Q 00050
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)        Q 00060
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)           Q 00070
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(5), FDH(23)                     Q 00080
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH                      Q 00090
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH                     Q 00100
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD         Q 00110
      COMMON    HBALOK,PHI                                                      Q 00120
      COMMON    SUMFD                                                           Q 00130
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L        Q 00140
      COMMON    NOV(30)                                                         Q 00150
      CONDLD = FDH(JC) + (QUID(JD) + QUID(JC) - FD(JC))*VAPMOH(JT) - QUI        Q 00160
     1D(JC)*QUIMOH(JC) - QUID(JD)*QUIMOH(JD)                                    Q 00170
      REBLD = CONDLD + QUID(1)*QUIMOH(1) + QUID(JD)*QUIMOH(JD) - FD1LIH         Q 00180
     1  - FD1VAH - FD2LIH - FD2VAH - FD3LIH - FD3VAH                           Q 00190
      SUMFD = 0.0                                                               Q 00200
      SUMFDH = 0.0                                                              Q 00210
      HBALOK = 0.0                                                              Q 00220
      BOTTH = QUID(1)*QUIMOH(1)                                                 Q 00230
      DO  131  J=1,JMIN                                                         Q 00240
      SUMFD = SUMFD + FD(J)                                                     Q 00250
      SUMFDH = SUMFDH + FDH(J)                                                  Q 00260
      QUIN = (REBLD + SUMFDH - BOTTH - VAPMOH(J)*(SUMFD-QUID(1))) /             Q 00270
     1    (VAPMOH(J)-QUIMOH(J+1))                                              Q 00280
      VAPN = QUIN - QUID(1) + SUMFD                                             Q 00290
      IF (ABS(QUIN-QUID(J+1))-0.1*QUID(J+1)) 120,120,122                        Q 00300
  120 IF (ABS(VAPN-VAPOR(J))-0.1*VAPOR(J)) 121,121,122                          Q 00310
  121 QUID(J+1) = QUIN                                                          Q 00320
      VAPOR(J) = VAPN                                                           Q 00330
      GO TO 131                                                                 Q 00340
  122 HBALOK = 1.0                                                              Q 00350
      IF (QUID(J+1)-VAPOR(J)) 123,123,127                                       Q 00360
  123 IF (QUIN-QUID(J+1)) 124,124,125                                           Q 00370
  124 QUID(J+1) = 0.9*QUID(J+1)                                                 Q 00380
      GO TO 126                                                                 Q 00390
  125 QUID(J+1) = 1.1*QUID(J+1)                                                 Q 00400
  126 VAPOR(J) = QUID(J+1) - QUID(1) + SUMFD                                    Q 00410
      GO TO 131                                                                 Q 00420
  127 IF (VAPN-VAPOR(J)) 128,128,129                                            Q 00430
  128 VAPOR(J) = 0.9*VAPOR(J)                                                   Q 00440
      GO TO 130                                                                 Q 00450
  129 VAPOR(J) = 1.1*VAPOR(J)                                                   Q 00460
  130 QUID(J+1) = VAPOR(J) + QUID(1) - SUMFD                                    Q 00470
  131 CONTINUE                                                                  Q 00480
      RETURN                                                                    Q 00490
      END                                                                       Q 00500
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
$OVERLAY     B                                                          R 00010
$FORTRAN                                                                R 00020
      SUBROUTINE  BUBPT(QUIDX,T,A,L,BPERR)                              R 00030
      DIMENSION    QUIDX(6), A(6,4)                                     R 00040
C                                                                       R 00050
C     SUBROUTINE FOR CALCULATING BUBBLE POINTS                          R 00060
C                                                                       R 00070
      KTIMES = 1                                                        R 00080
      IBP = -1                                                          R 00090
    3 SUMY = 0.0                                                        R 00100
      IBP = IBP + 1                                                     R 00130
      DO  4  I=1,L                                                      R 00140
      Y = EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),T) * QUIDX(I)              R 00150
      SUMY = SUMY + Y                                                   R 00160
    4 CONTINUE                                                          R 00170
      IF (ABS(SUMY-1.0)-BPERR) 8,8,5                                    R 00180
    5 KTIMES = KTIMES - 1                                               R 00190
      IF (KTIMES) 7,6,6                                                 R 00200
    6 SUMYO = SUMY                                                      R 00210
      TO = T                                                            R 00220
      T = T + 10.0                                                      R 00230
      GO TO 3                                                           R 00240
    7 SLOPE = (SUMY-SUMYO)/(T-TO)                                       R 00250
      TN = ((1.0-SUMY) / SLOPE) + T                                     R 00260
      SUMYO = SUMY                                                      R 00270
      TO = T                                                            R 00280
      T = TN                                                            R 00290
      GO TO 3                                                           R 00300
    8 CONTINUE                                                          R 00310
      WRITE   (10,101)  IBP                                             R 00311
  101 FORMAT   (110X,3HBP ,I4)                                          R 00312
      RETURN                                                            R 00313
      END                                                               R 00320
```

```
$OVERLAY     B                                                          S 00010
$FORTRAN                                                                S 00020
      SUBROUTINE  DEWPT (VAPY,T,A,L,BPERR)                              S 00030
      DIMENSION    VAPY(6), A(6,4)                                      S 00040
C                                                                       S 00050
C     SUBROUTINE FOR CALCULATING DEW POINTS                             S 00060
C                                                                       S 00070
      IDP = -1                                                          S 00080
      KTIMES = 1                                                        S 00090
    3 SUMX = 0.0                                                        S 00100
      IDP = IDP + 1                                                     S 00130
      DO  4  I=1,L                                                      S 00140
      X = VAPY(I)/EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),T)                 S 00150
      SUMX = SUMX + X                                                   S 00160
    4 CONTINUE                                                          S 00170
      IF (ABS(SUMX-1.0)-BPERR) 8,8,5                                    S 00180
    5 KTIMES = KTIMES + 1                                               S 00190
      IF (KTIMES) 7,6,6                                                 S 00200
    6 SUMX0 = SUMX                                                      S 00210
      T0 = T                                                            S 00220
      T = T + 10.0                                                      S 00230
      GO TO 3                                                           S 00240
    7 SLOPE = (SUMX-SUMX0) / (T-T0)                                     S 00250
      TN = ((1.0-SUMX) / SLOPE) + T                                     S 00260
      SUMX0 = SUMX                                                      S 00270
      T0 = T                                                            S 00280
      T = TN                                                            S 00290
      GO TO 3                                                           S 00300
    8 CONTINUE                                                          S 00310
      WRITE   (10,101)   IDP                                            S 00311
  101 FORMAT   (110X,3HDP ,I4)                                          S 00312
      RETURN                                                            S 00313
      END                                                               S 00320
```

```
$DATA
   ROUTINE   RELOC ENTRY   ROUTINE   RELOC ENTRY   ROUTINE   RELOC ENTRY   ROUTIN
    NAME     FACTOR POINT    NAME    FACTOR POINT    NAME    FACTOR POINT    NAME
     ,KP     06000 06000     EQUILK  06444 06444     THALP   06555 06556
    DATA     06646 06646
OVERLAY  A     , NUMBER  01, STARTS  06645, LENGTH  01574, LOWEST COMMON 35370
    DOUT     06646 06646
OVERLAY  A     , NUMBER  02, STARTS  06645, LENGTH  01514, LOWEST COMMON 35370
    INIT     06646 06646
OVERLAY  A     , NUMBER  03, STARTS  06645, LENGTH  00345, LOWEST COMMON 35370
   PLATE     06646 06646
OVERLAY  A     , NUMBER  04, STARTS  06645, LENGTH  01010, LOWEST COMMON 35370
   ROTUP     06646 06646
OVERLAY  A     , NUMBER  05, STARTS  06645, LENGTH  01114, LOWEST COMMON 35370
   TOPDN     06646 06646
OVERLAY  A     , NUMBER  06, STARTS  06645, LENGTH  01134, LOWEST COMMON 35370
    PHEE     06646 06646
OVERLAY  A     , NUMBER  07, STARTS  06645, LENGTH  00647, LOWEST COMMON 35370
   CPLAT     06646 06646
OVERLAY  A     , NUMBER  08, STARTS  06645, LENGTH  00725, LOWEST COMMON 35370
   PDSUM     06646 06646
OVERLAY  A     , NUMBER  09, STARTS  06645, LENGTH  00500, LOWEST COMMON 35370
   WROUT     06646 06646
OVERLAY  A     , NUMBER  10, STARTS  06645, LENGTH  01414, LOWEST COMMON 35370
   TCORR     06646 06646
OVERLAY  A     , NUMBER  11, STARTS  06645, LENGTH  00623, LOWEST COMMON 35370
    ENTH     06646 06646
OVERLAY  A     , NUMBER  12, STARTS  06645, LENGTH  01040, LOWEST COMMON 35370
   FLOCA     06646 06646
OVERLAY  A     , NUMBER  13, STARTS  06645, LENGTH  01303, LOWEST COMMON 35370
   FLOCB     06646 06646
OVERLAY  A     , NUMBER  14, STARTS  06645, LENGTH  01140, LOWEST COMMON 35370
   BUBPT     10442 10442
OVERLAY  B     , NUMBER  15, STARTS  10442, LENGTH  00341, LOWEST COMMON 35370
   DEWPT     10442 10442
OVERLAY  B     , NUMBER  16, STARTS  10442, LENGTH  00345, LOWEST COMMON 35370
LIBRARY ROUTINES USED
     ,I3     11010 11014      ABS     11106 11116     FLOAT  11132 11132      ,RI
     ALOG    11300 11302      EXP     11410 11410     OVRLAY 11574 11574      ,L1
  FIRST LOCATION  NOT USED 12051, LOWEST COMMON 17737
```

AB - Listagem do Programa para os Exemplos III.1.B e III.1.C

Formato A 4 - 210x297 mm

```
 FORTRAN IV, CD225H6.004,    JUL   1967
$JOB      NOLIST,NOCARDS
$FORTRAN
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON     HBALOK,PHI
      COMMON     SUMFD
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON     NOV(30)
      DATA  NOV/01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,
     1             19,20,21,22,23,24,25,26,27,28,29,30/
C
C IF THE PROGRAM IS TO BE CHANGED TO ADD MORE COMPONENTS .  NOTE MAXIMUM
C  NO OF COMPONENTS IS LIMITED BY COMPUTATIONS USING TS(I+60) TO 20
C
C     NOV 1  DATA
C         2  DOUT
C         3  INIT
C         4  PLATE
C         5  BOTUP
C         6  TOPDN
C         7  PHEE
C         8  CPLAT
C         9  PDSUM
C        10  WROUT
C        11  TCORR
C        12  ENTH
C        13  FLOCA
C        14  FLOCB
C        15  BUBPT
C        16  DEWPT
C
C
      NIC = 10
      NIW = 10
 1000 CONTINUE
C       DO NEW SET OF DATA
      WRITE   (NIW,1001)
 1001 FORMAT   (1H1)
      CALL OVRLAY (NOV(01))
      CALL DATA
      TEMP(1)=180.0
      QUIDX(1)=0.50
      QUIDX(2)=0.30
      QUIDX(3)=0.10
      QUIDX(4)=0.10
      CALL OVRLAY(NOV(15))
      CALL BUBPT(QUIDX,TEMP(1),A,L,BPERR)
      DO  200  J=1,JD
      TEMP(J) = TEMP(1)
  200 CONTINUE
      FD1LIH = 0.0
      DO  201  I=1,L
      FD1LIH = FD1LIH + FD1LIQ(I)*THALP(EL(I,1),EL(I,2),EL(I,3),TEMP(1))
```

```
  201 CONTINUE
      CALL OVRLAY (NOV(02))
      CALL DOUT
      CALL OVRLAY (NOV(03))
      CALL INIT
   15 CONTINUE
      DO  35  I=1,L
      NPT = 0
      CALL OVRLAY (NOV(04))
      CALL PLATE(I)
      IF  (NPT)  28, 1002, 1002
 1002 CONTINUE
      CALL OVRLAY (NOV(05))
      CALL BOTUP(I)
      GO TO  35
   28 CONTINUE
      CALL OVRLAY (NOV(06))
      CALL TOPDN(I)
   35 CONTINUE
      CALL OVRLAY (NOV(07))
      CALL PHEE
      CALL OVRLAY (NOV(08))
      CALL CPLAT
      CALL OVRLAY (NOV(09))
      CALL PDSUM
      CALL OVRLAY (NOV(10))
      CALL WROUT
      IF (ICON)  107, 1000, 98
   98 CONTINUE
      CALL OVRLAY (NOV(11))
      CALL TCORR
      CALL OVRLAY (NOV(12))
      CALL ENTH
  107 CONTINUE
      CALL OVRLAY (NOV(13))
      CALL FLOCA
      CALL OVRLAY (NOV(14))
      CALL FLOCB
      GO TO  15
      END
```

```
$FORTRAN
      FUNCTION   EQUILK (A,B,C,D,T)
      Q = T + 459.69
      Z = ((D*Q+C)*Q+B)*Q+A
      EQUILK = Z*Z*Z*Q
      RETURN
      END
```

```
$FORTRAN
      FUNCTION   THALP (A,B,C,T)
      Q = T+459,69
      Z = (C*Q+B)*Q+A
      THALP = Z*Z
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE  DATA
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
      DIMENSION    NICHIS(380)
    3 FORMAT   (5I3)
      READ    (NIC,3)   L,M,M1,M2,N
      JT = M+M1+M2+N+1
      JC = JT+1
      JD = JC+1
      JMIN=JT-1
    4 FORMAT    (9F8.0)
      READ    (NIC,4)   (TEMP(J),J=1,JD)
      READ    (NIC,4)   (VAPOR(J),J=1,JD)
      READ    (NIC,4)   (QUID(J),J=1,JD)
      READ    (NIC,4)   (FD1LIQ(I),I=1,L)
      READ    (NIC,4)   (FD1VAP(I),I=1,L)
      READ    (NIC,4)   (FD2LIQ(I),I=1,L)
      READ    (NIC,4)   (FD2VAP(I),I=1,L)
      READ    (NIC,4)   (FD3LIQ(I),I=1,L)
      READ    (NIC,4)   (FD3VAP(I),I=1,L)
    5 FORMAT   (4E20.0)
      READ    (NIC,5)  ((A(I,J),J=1,4),I=1,L)
      READ    (NIC,5)  ((EL(I,J),J=1,4),I=1,L)
      READ    (NIC,5)  ((EV(I,J),J=1,4),I=1,L)
      READ    (NIC,4)   FD1LIS,FD1VAS,FD2LIS,FD2VAS,FD3LIS,FD3VAS
      READ    (NIC,4)   FD1LIH,FD1VAH,FD2LIH,FD2VAH,FD3LIH,FD3VAH
      READ    (NIC,4)   PHIERR,SUMERR,BPERR
C      WHEN IS5 IS ZERO OR NEG   =  ONLY FINAL OUTPUT IS PRINTED
      READ   (NIC,3)    IS5
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DOUT
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
    5 FORMAT   (48H1INPUT DATA FOR PROB. NO.        USING PROGRAM 1)
      WRITE    (NIW,5)
    6 FORMAT   (116HONO. OF COMPONENTS     PLATES IN SECTION M     PLATE
     1S IN SECTION M1     PLATES IN SECTION M2     PLATES IN SECTION N,/
     2,I10,I23,I24,I25,I25)
      WRITE    (NIW,6)   L,M,M1,M2,N
    7 FORMAT   (65HOFEED FLOWS AND ENTHALPIES IN ORDER OF LOWEST ENTERIN
     1G TO HIGHEST,/,91HO7OLES FEED LIQUID    MOLES FEED VAPOR    ENTHAL
     2PY OF FEED LIQUID    ENTHALPY OF FEED VAPOR,/,(E16.8,E21.8,E23.8,E
     327.8))
      WRITE    (NIW,7)   FD1LIS,FD1LIH,FD1VAS,FD1VAH,FD2LIS,FD2LIH,
     1                  FD2VAS,FD2VAH,FD3LIS,FD3LIH,FD3VAS,FD3VAH
    8 FORMAT   (23HOCOMPONENT FEED AMOUNTS,/,95H                LOWEST FE
     1ED                  INTERMEDIATE FEED                  HIGHEST
     2 FEED,/,98H        LIQUID             VAPOR             LIQUID
     3    VAPOR            LIQUID             VAPOR,/,(6E17.8))
      WRITE    (NIW,8)   (FD1LIQ(I),FD1VAP(I),FD2LIQ(I),FD2VAP(I),FD3LIQ(
     1I),FD3VAP(I),I=1,L)
    9 FORMAT   (111HOEQUILIBRIUM CONSTANTS A      EQUILIBRIUM CONSTANTS B
     1      EQUILIBRIUM CONSTANTS C      EQUILIBRIUM CONSTANTS D,/,
     2  (E19.8,3E29.8))
      WRITE    (NIW,9)   ((A(I,J),J=1,4),I=1,L)
   10 FORMAT   (112HOENTHALPY CONSTANTS A1     ENTHALPY CONSTANTS A2
     1ENTHALPY CONSTANTS A3                                FOR LIQUID,/,
     2 (E18.8,2E26.8))
      WRITE    (NIW,10)   ((EL(I,J),J=1,3),I=1,L)
 2010 FORMAT   (112HOENTHALPY CONSTANTS A1     ENTHALPY CONSTANTS A2
     1ENTHALPY CONSTANTS A3                                FOR VAPOR ,/,
     2 (E18.8,2E26.8))
      WRITE    (NIW,2010)   ((EV(I,J),J=1,3),I=1,L)
   11 FORMAT   (82HOERROR LIMIT ON PHI      ERROR LIMIT ON SUMMATION
     1  ERROR LIMIT ON BUBBLE POINT,/,(E17.8,E25.8,E33.8))
      WRITE    (NIW,11)   PHIERR,SUMERR,BPERR
   12 FORMAT   (55HO       TEMPERATURES       VAPOR FLOWS      LIQUID FLO
     1WS,/,(3E19.8))
      WRITE    (NIW,12)   (TEMP(I),VAPOR(I),QUID(I),I=1,JD)
      IF (IS5) 1051,1051,1053
 1050 FORMAT   (26HOONLY FINAL OUTPUT PRINTED)
 1051 WRITE    (NIW,1050)
 1052 FORMAT   (41HOOUTPUT WILL BE GIVEN FOR EVERY ITERATION)
 1053 WRITE    (NIW,1052)
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE  INIT
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
      SUBRT = 0.0
      CHECK = 0.0
      COUNT = 0.0
      TEST = 0.0
      ITERAT = 0
      CONDLD = 0.0
      REBLD = 0.0
      HBALOK = 1.0
      DO  13  J=1,JD
      VAPMOH(J) = 0.0
      QUIMOH(J) = 0.0
   13 CONTINUE
      DO  14  I=1,L
      TS(I) =FD1LIQ(I)+FD1VAP(I)+FD2LIQ(I)+FD2VAP(I)+FD3LIQ(I)+FD3VAP(I)
   14 CONTINUE
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   PLATE(I)
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
C
C CALCULATION OF PLATE COMPOSITIONS
C
      DO  16  J=1,JT
      SF(J)=VAPOR(J)*EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),TEMP(J))/QUID(J)
      FD(J) = 0.0
   16 CONTINUE
      FD(JC) = 0.0
      J=M+1
      FD(J) = FD1LIQ(I)*FD(J)
      J = M + 2
      FD(J) = FD1VAP(I) + FD(J)
      J = M + M1 + 1
      FD(J) = FD2LIQ(I) + FD(J)
      J = M + M1 + 2
      FD(J) = FD2VAP(I) + FD(J)
      J = M + M1 + M2 +1
      FD(J) = FD3LIQ(I) + FD(J)
      J = M + M1 + M2 + 2
      FD(J) = FD3VAP(I) + FD(J)
   17 ERRRAU = 1.0
      DO  18  J=1,JT
      ERRRAU = SF(J)*ERRRAU + 1.0
      IF (1.0E20-ERRRAU) 28,28,18
   18 CONTINUE
      ERRRAU = ERRRAU*QUID(JD)/QUID(JC)
      ERRRAD = QUID(JC)/QUID(JD)
      J = JC
      DO  19  K=1,JT
      ERRRAD = (ERRRAD+1.0)/SF(J-1)
      IF (1.0E20-ERRRAD) 21,21,19
   19 J = J-1
   20 IF (ERRRAU-ERRRAD) 21,21,28
   21 NPT = 1
      RETURN
   28 NPT = -1
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   BOTUP(I)
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FD4(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
   21 GENX(I,1) = TS(I)
      SUMFD = 0.0
      ERRRAT(1) = 1.0
      DO  24  J=1,JT
      SUMFD = SUMFD + FD(J)
      ERRRAT(J+1) = SF(J)*ERRRAT(J) + 1.0
      PROD = GENX(I,1) - SUMFD
      IF (PROD) 22,22,23
   22 GENX(I,J+1) = SF(J)*GENX(I,J)+1.0E-20
      GO TO 24
   23 GENX(I,J+1) = SF(J)*GENX(I,J) + PROD + 1.0E-20
   24 CONTINUE
      ERRRAT(JD) = ERRRAT(JC)*QUID(JD)/QUID(JC)
      GENX(I,JD) = GENX(I,JC)*QUID(JD)/QUID(JC)
      ERRBOT = GENX(I,JD)/(ERRRAT(JD)+1.0)
      DO  27  J=1,JD
      GENXN = (GENX(I,J)-ERRRAT(J)*ERRBOT)/QUID(J)
      IF (GENXN) 25,25,26
   25 GENX(I,J) = SF(J-1)*QUID(J-1)*GENX(I,J-1)/QUID(J)+1.0E-20
      IF ((J-1 .LE. 0) .OR. (J-1 .GE. JC))  GO TO 1110
      GO TO 27
 1110 WRITE   (NIW,1009) J - 1
 1009 FORMAT   (1H1, 20(1H*), 22H VORSICHT BOTUP J-1 = , I5, 20(1H*))
      GO TO 27
   26 GENX(I,J) = GENXN + 1.0E-20
   27 CONTINUE
      GO TO 35
   35 RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE  TOPDN(I)
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
   28 SUMFD = 0.0
      GENX(I,JD) = TS(I)
      GENX(I,JC) = GENX(I,JD)*QUID(JC)/QUID(JD)
      ERRRAT(JC) = QUID(JC)/QUID(JD)
      J = JC
      DO  31  K=1,JT
      SUMFD = SUMFD + FD(J)
      ERRRAT(J-1) = (ERRRAT(J) + 1.0)/SF(J-1)
      PROD = GENX(I,JD) - SUMFD
      IF (PROD) 29,29,30
   29 GENX(I,J-1) = GENX(I,J)/SF(J-1) + 1.0E-20
      GO TO 31
   30 GENX(I,J-1) = (GENX(I,J) + PROD)/SF(J-1) + 1.0E-20
   31 J = J-1
      ERRTOP = GENX(I,1)/(ERRRAT(1) + 1.0)
      GENX(I,JD) = (GENX(I,JD)-ERRTOP)/QUID(JD)
      J = JC
      DO  34  K=1,JC
      GENXN = (GENX(I,J)-ERRRAT(J)*ERRTOP)/QUID(J)
      IF (GENXN) 32,32,33
   32 GENX(I,J) = (QUID(J+1)*GENX(I,J+1))/SF(J)/QUID(J) + 1.0E-20
      IF (J .GE. JC)  GO TO 1100
      GO TO 34
 1100 WRITE   (NIW,1010) J
 1010 FORMAT   (1H1, 20(1H*), 25H CAREFUL TOPDN, J =      ,I5, 25(1H*))
      GO TO 34
   33 GENX(I,J) = GENXN + 1.0E-20
   34 J = J - 1
   35 CONTINUE
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE  PHEE
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
C
C CALCULATION OF PHI
C
C
      DO  36  I=1,L
   36 TS(I+20) = GENX(I,1)/GENX(I,JD)
      KTIMES = 1
      PHI = 1.0
      PHIP = PHI
   37 SUMXD = 0.0
      DO  38  I=1,L
      TS(I+40) = TS(I)/(QUID(1)*TS(I+20)*PHI+ QUID(JD))
      TS(I+60) = TS(I)/(QUID(JD)/(TS(I+20)*PHI) + QUID(1))
      SUMXD = SUMXD + TS(I+40)
   38 CONTINUE
      IF (ABS(SUMXD-1.0)-PHIERR) 44,44,39
   39 KTIMES = KTIMES + 1
      IF (KTIMES) 41,40,40
   40 SUMXDO = SUMXD
      PHIO = PHI
      PHI = 0.9
      GO TO 37
   41 SLOPE = (SUMXD-SUMXDO)/(PHI-PHIO)
      PHIN = ((1.0-SUMXD)/SLOPE) + PHI
      SUMXDO = SUMXD
      PHIO = PHI
      IF (PHIN) 42,42,43
   42 PHI = 0.9*PHI
      GO TO 37
   43 PHI = PHIN
      GO TO 37
   44 IF (TEST) 49,49,45
   45 IF ((PHI-1.0)*(PHIP-1.0)) 46,47,47
   46 COUNT = COUNT + 1.0
      GO TO 49
   47 COUNT = COUNT - 1.0
      IF (COUNT) 48,49,49
   48 COUNT = 0.0
   49 TEST = TEST + 1.0
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE  CPLAT
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(5), FDH(23)
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON     HBALOK,PHI
      COMMON     SUMFD
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON     NOV(30)
C
C CORRECTION OF PLATE COMPOSITIONS
C
      DO  69  I=1,L
      IF (FD3VAP(I)+FD3LIQ(I)) 51,51,50
   50 KP = N
      GO TO 54
   51 IF (FD2VAP(I) + FD2LIQ(I)) 53,53,52
   52 KP = N+M2
      GO TO 54
   53 KP = N + M2 + M1
   54 RATIO = (TS(I+40)/GENX(I,JD)+COUNT)/(COUNT + 1,0)
      IF (ABS(RATIO-1,0)-1,0E-06) 59,59,55
   55 FACTOR = RATIO**(1,0/FLOAT(KP+1))
      J = JT
      DO  58  K=1,KP
      RATIO = RATIO/FACTOR
      GENXN = GENX(I,J)*RATIO
      IF (GENXN-1,0) 56,56,57
   56 GENX(I,J) = GENXN
      GO TO 58
   57 GENX(I,J) = 1,0
   58 J = J-1
   59 IF (FD1LIQ(I)+FD1VAP(I)) 61,61,60
   60 KP = M
      GO TO 64
   61 IF (FD2LIQ(I) + FD2VAP(I)) 63,63,62
   62 KP = M + M1
      GO TO 64
   63 KP = M + M1 + M2
   64 RATIO = (TS(I+60)/GENX(I,1) + COUNT)/(COUNT+1,0)
      IF (ABS(RATIO-1,0)-1,0E-6) 69,69,65
   65 FACTOR = RATIO**(1,0/FLOAT(KP+1))
      J = 2
      DO  68  K=1,KP
      RATIO = RATIO/FACTOR
      GENXN = GENX(I,J)*RATIO
      IF (GENXN-1,0) 66,66,67
   66 GENX(I,J) = GENXN
      GO TO 68
   67 GENX(I,J) = 1,0
   68 J = J+1
   69 CONTINUE
      RETURN
```

```
END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE  PDSUM
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    MBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
C
C PRODUCT AMOUNTS    RECOVERY FRACTIONS     SUMMMATIONS
C
      SUMFD = 0.0
      DO  70  I=1,L
      SUMFD = SUMFD + TS(I)
      GENX(I,JD) = TS(I+40)
      GENX(I,JC) = TS(I+40)
      GENX(I,1) = TS(I+60)
      TOPP(I) = QUID(JD)*TS(I+40)
      RFTOP(I) = TOPP(I)/TS(I)
      BOTP(I) = QUID(1)*TS(I+60)
      RFBOT(I) = BOTP(I)/TS(I)
   70 CONTINUE
      DO  71  J=1,JD
      SUM(J) = 0.0
      DO  71  I=1,L
      SUM(J) = SUM(J) + GENX(I,J)
   71 CONTINUE
      RETURN
      END
```



```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   WROUT
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
C
C OUTPUT
C
      ICON = 100

      IF (ABS(  M(J)-.  )-SUMERR+HBALOK) 73, 3,98
   73 CONTINUE
   74 FORMAT   (12H1PROBLEM NO.,/,17H0ITERATION NO. = ,I3,/,53H0LIQUID M
     1OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)
   75 WRITE    (NIW,74)    ITERAT
   76 FORMAT    (21H0       BOTTOM PRODUCT,/,(5E20.8))
      WRITE    (NIW,76)    (GENX(I,1),I=1,L)
      JPLATE = 0
      DO   78   J=2,JT
      JPLATE = JPLATE+1
   77 FORMAT    (19H0       PLATE NO. = ,I3,/,(5E20.8))
      WRITE    (NIW,77)    JPLATE,(GENX(I,J),I=1,L)
   78 CONTINUE
   79 FORMAT    (13H0       REFLUX, /,(5E20.8))
      WRITE    (NIW,79)    (GENX(I,JC),I=1,L)
   80 FORMAT    (18H0       TOP PRODUCT,/,(5E20.8))
      WRITE    (NIW,80)    (GENX(I,JD),I=1,L)
   81 FORMAT    (34H0BOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))
      WRITE    (NIW,81)    (RFBOT(I),I=1,L)
   82 FORMAT    (31H0TOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))
      WRITE    (NIW,82)    (RFTOP(I),I=1,L)
   83 FORMAT    (27H0MOLES OF FEED AND PRODUCTS)
      WRITE    (NIW,83)
   84 FORMAT    (70H0       COMPONENT            FEED          BOTTOM PRODUCT
     1       TOP PRODUCT,/,(I11,E22.8,2E19.8))
      WRITE    (NIW,84)    (I,TS(I),BOTP(I),TOPP(I),I=1,L)
   85 FORMAT    (2H  ,/,E33.8,2E19.8)
      WRITE    (NIW,85)    SUMFD,QUID(1),QUID(JD)
   86 FORMAT    (16H0PLATE VARIABLES)
      WRITE    (NIW,86)
   87 FORMAT    (115H0        SUMMATIONS          TEMPERATURES        VAPOR F
     1LOWS          LIQUID FLOWS     VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,
     2 (6E19.8))
      WRITE    (NIW,87)    (SUM(J),TEMP(J),VAPOR(J),QUID(J),VAPMOH(J),
     1                     QUIMOH(J),J=1,JD)
   88 FORMAT    (18H0CONDENSER LOAD = ,E15.8,/,17H0REBOILER LOAD = ,E15.8
     1,/,7H0PHI = ,E15.8)
```

```
      WRITE    (NIW,86)    CONDLD,REBLD,PHI
      DO  89  J=1,JD
      IF (ABS(SUM(J)-1.0)-SUMERR*HBALOK) 89,89,98
   89 CONTINUE
      ICON = 0
      RETURN
   98 ICON = 1
      RETURN
C      IF RETURNING FROM A CONTROL SUBROUTINE SET ICON = -1
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   TCORR
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
C
C CORRECTION OF TEMPERATURES
C
      CALL OVRLAY (NOV(15))
   98 DO  99  J=1,JC
      DO  99  I=1,L
      GENX(I,J) = GENX(I,J)/SUM(J)
   99 CONTINUE
      DO  100 I=1,L
  100 QUIDX(I) = GENX(I,1)
      CALL BUBPT (QUIDX,TEMP(1),A,L,BPERR)
      DO  102  J=2,JT
      T = TEMP(J)
      DO  101  I=1,L
  101 QUIDX(I) = GENX(I,J)
      CALL BUBPT (QUIDX,T,A,L,BPERR)
      TEMP(J) = (COUNT*TEMP(J)+T)/(COUNT+1.0)
  102 CONTINUE
      DO  103  I=1,L
      QUIDX(I) = GENX(I,JC)
  103 CONTINUE
      CALL BUBPT (QUIDX,TEMP(JC),A,L,BPERR)
      TEMP(JD) = TEMP(JC)
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   ENTH
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON     HBALOK,PHI
      COMMON     SUMFD
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON     NOV(30)
C
C CALCULATION OF  MOLAL ENTHALPIES
C
      DO  105  J=1,JT
      VAPMOH(J) = 0.0
      QUIMOH(J) = 0.0
      SUMY = 0.0
      DO  104  I=1,L
      SUMY = SUMY+ GENX(I,J)*EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),TEMP(J))
      VAPMOH(J) = VAPMOH(J) + THALP(EV(I,1),EV(I,2),EV(I,3),TEMP(J))*GEN
     1X(I,J)*EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),TEMP(J))
      QUIMOH(J) = QUIMOH(J) + THALP(EL(I,1),EL(I,2),EL(I,3),TEMP(J))*
     1  GENX(I,J)
  104 CONTINUE
      VAPMOH(J) = VAPMOH(J)/SUMY
  105 CONTINUE
      QUIMOH(JC) = 0.0
      DO  106  I=1,L
      QUIMOH(JC) = QUIMOH(JC) + THALP(EL(I,1),EL(I,2),EL(I,3),TEMP(JC))*
     1   GENX(I,JC)
  106 CONTINUE
      QUIMOH(JD) = QUIMOH(JC)
      RETURN
      END
```

```
$OVERLAY      A
$FORTRAN
      SUBROUTINE   FLOCA
      COMMON    GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON    VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON    FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON    FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON    BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON     FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON     FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON     PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON     HBALOK,PHI
      COMMON     SUMFD
      COMMON     IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON     NOV(30)
C
C CORRECTION OF FLOWS
C
C
  107 DO  108  J=1,JC
      FD(J) = 0.0
  108 FDH(J) = 0.0
      J = M+1
      FD(J) = FD1LIS + FD(J)
      FDH(J) = FD1LIH + FDH(J)
      J = M+2
      FD(J) = FD1VAS + FD(J)
      FDH(J) = FD1VAH + FDH(J)
      J = M + M1 + 1
      FD(J) = FD2LIS + FD(J)
      FDH(J) = FD2LIH + FDH(J)
      J = M + M1 + 2
      FD(J) = FD2VAS + FD(J)
      FDH(J) = FD2VAH + FDH(J)
      J = M + M1 + M2 + 1
      FD(J) = FD3LIS + FD(J)
      FDH(J) = FD3LIH + FDH(J)
      J = M + M1 + M2 + 2
      FD(J) = FD3VAS + FD(J)
      FDH(J) = FD3VAH + FDH(J)
      VAPOR(JT) = QUID(JD) + QUID(JC) - FD(JC)
      DO  109  I=1,L
  109 TS(I+20) = 0.0
      IF (FD(JC)) 117,117,110
  110 DO  111  I=1,L
  111 TS(I+20) = FD1VAP(I)
      IF (FD2VAS) 114,114,112
  112 DO  113  I=1,L
  113 TS(I+20) = FD2VAP(I)
  114 IF (FD3VAS) 117,117,115
  115 DO  116  I=1,L
  116 TS(I+20) = FD3VAP(I)
  117 DO  118  I=1,L
      VAPY(I) = (QUID(JD)*GENX(I,JD) + QUID(JC)*GENX(I,JC) - TS(I+20))/
     1 VAPOR(JT)
  118 CONTINUE
      CALL OVRLAY (NOV(16))
      CALL DEWPT (VAPY,TEMP(JT),A,L,BPERR)
      VAPMOH(JT) = 0.0
```

```
      DO  119  I=1,L
      VAPMOH(JT) = VAPMOH(JT) + VAPY(I)*THALP(EV(I,1),EV(I,2),EV(I,3),TE
     1MP(JT))
  119 CONTINUE
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   FLOCB
      COMMON   GENX(6,23), SUM(23), TEMP(23), VAPOR(23), QUID(23)
      COMMON   VAPMOH(23), QUIMOH(23), FD1LIQ(6), FD1VAP(6), FD2LIQ(6)
      COMMON   FD2VAP(6), FD3LIQ(6), FD3VAP(6), A(6,4), EV(6,4), EL(6,4)
      COMMON   FD(23), ERRRAT(23), SF(23), TS(80), RFBOT(6), RFTOP(6)
      COMMON   BOTP(6), TOPP(6), QUIDX(6), VAPY(6), FDH(23)
      COMMON    FD1LIS,FD2LIS,FD3LIS, FD1LIH,FD2LIH,FD3LIH
      COMMON    FD1VAS,FD2VAS,FD3VAS,  FD1VAH,FD2VAH,FD3VAH
      COMMON    PHIERR,SUMERR,BPERR,SUBRT,CHECK,COUNT,TEST,CONDLD,REBLD
      COMMON    HBALOK,PHI
      COMMON    SUMFD
      COMMON    IS5,NPT,ICON,NIW,NIC,KT,ITERAT,JT,JD,JC,JMIN,M,M1,M2,N,L
      COMMON    NOV(30)
      CONDLD = FDH(JC) * (QUID(JD) + QUID(JC) - FD(JC))*VAPMOH(JT) + QUI
     1D(JC)*QUIMOH(JC) + QUID(JD)*QUIMOH(JD)
      REBLD = CONDLD + QUID(1)*QUIMOH(1) + QUID(JD)*QUIMOH(JD) - FD1LIH
     1  - FD1VAH - FD2LIH - FD2VAH - FD3LIH - FD3VAH
      SUMFD = 0.0
      SUMFDH = 0.0
      HBALOK = 0.0
      BOTTH = QUID(1)*QUIMOH(1)
      DO  131  J=1,JMIN
      SUMFD = SUMFD + FD(J)
      SUMFDH = SUMFDH + FDH(J)
      QUIN = (REBLD + SUMFDH - BOTTH - VAPMOH(J)*(SUMFD-QUID(1))) /
     1    (VAPMOH(J)-QUIMOH(J+1))
      VAPN = QUIN + QUID(1) + SUMFD
      IF (ABS(QUIN-QUID(J+1))-0.1*QUID(J+1)) 120,120,122
  120 IF (ABS(VAPN-VAPOR(J))-0.1*VAPOR(J)) 121,121,122
  121 QUID(J+1) = QUIN
      VAPOR(J) = VAPN
      GO TO 131
  122 HBALOK = 1.0
      IF (QUID(J+1)-VAPOR(J)) 123,123,127
  123 IF (QUIN-QUID(J+1)) 124,124,125
  124 QUID(J+1) = 0.9*QUID(J+1)
      GO TO 126
  125 QUID(J+1) = 1.1*QUID(J+1)
  126 VAPOR(J) = QUID(J+1) - QUID(1) + SUMFD
      GO TO 131
  127 IF (VAPN-VAPOR(J)) 128,128,129
  128 VAPOR(J) = 0.9*VAPOR(J)
      GO TO 130
  129 VAPOR(J) = 1.1*VAPOR(J)
  130 QUID(J+1) = VAPOR(J) + QUID(1) + SUMFD
  131 CONTINUE
      RETURN
      END
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
$OVERLAY     B
$FORTRAN
      SUBROUITNE  BUBPT(QUIDX,T,A,L,BPERR)
      DIMENSION    QUIDX(6), A(6,4)
C
C     SUBROUTINE FOR CALCULATING BUBBLE POINTS
C
      KTIMES = 1
      IBP = -1
    3 SUMY = 0.0
      IBP = IBP + 1
      DO  4  I=1,L
      Y = EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),T) * QUIDX(I)
      SUMY = SUMY + Y
    4 CONTINUE
      IF (ABS(SUMY-1.0)-BPERR) 8,8,5
    5 KTIMES = KTIMES + 1
      IF (KTIMES) 7,6,6
    6 SUMYO = SUMY
      TO = T
      T = T + 10.0
      GO TO 3
    7 SLOPE = (SUMY-SUMYO)/(T-TO)
      TN = ((1.0-SUMY) / SLOPE) + T
      SUMYO = SUMY
      TO = T
      T = TN
      GO TO 3
    8 CONTINUE
      WRITE   (10,101)  IBP
  101 FORMAT   (110X,3HBP ,I4)
      RETURN
      END
```

```
$OVERLAY     B
$FORTRAN
      SUBROUTINE  DEWPT (VAPY,T,A,L,BPERR)
      DIMENSION    VAPY(6), A(6,4)
C
C     SUBROUTINE FOR CALCULATING DEW POINTS
C
      IDP = -1
      KTIMES = 1
    3 SUMX = 0.0
      IDP = IDP + 1
      DO  4  I=1,L
      X = VAPY(I)/EQUILK(A(I,1),A(I,2),A(I,3),A(I,4),T)
      SUMX = SUMX + X
    4 CONTINUE
      IF (ABS(SUMX-1.0)-BPERR) 8,8,5
    5 KTIMES = KTIMES - 1
      IF (KTIMES) 7,6,6
    6 SUMXO = SUMX
      TO = T
      T = T + 10.0
      GO TO 3
    7 SLOPE = (SUMX-SUMXO) / (T-TO)
      TN = ((1.0-SUMX) / SLOPE) + T
      SUMXO = SUMX
      TO = T
      T = TN
      GO TO 3
    8 CONTINUE
      WRITE   (10,101)   IDP
  101 FORMAT   (110X,3HDP ,I4)
      RETURN
      END
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
$DATA
   ROUTINE   RELOC ENTRY    ROUTINE   RELOC ENTRY    ROUTINE   RELOC ENTRY    ROU
      NAME   FACTOR POINT       NAME   FACTOR POINT      NAME   FACTOR POINT     N
       .KP    06000 06000      EQUILK 06736 06736       THALP  07054 07054
      DATA    07160 07160
 OVERLAY  A     , NUMBER  01, STARTS  07157, LENGTH  01574, LOWEST COMMON 35370
      DOUT    07160 07160
 OVERLAY  A     , NUMBER  02, STARTS  07157, LENGTH  01514, LOWEST COMMON 35370
      INIT    07160 07160
 OVERLAY  A     , NUMBER  03, STARTS  07157, LENGTH  00345, LOWEST COMMON 35370
      PLATE   07160 07160
 OVERLAY  A     , NUMBER  04, STARTS  07157, LENGTH  01010, LOWEST COMMON 35370
      BOTUP   07160 07160
 OVERLAY  A     , NUMBER  05, STARTS  07157, LENGTH  01102, LOWEST COMMON 35370
      TOPDN   07160 07160
 OVERLAY  A     , NUMBER  06, STARTS  07157, LENGTH  01134, LOWEST COMMON 35370
      PHEE    07160 07160
 OVERLAY  A     , NUMBER  07, STARTS  07157, LENGTH  00647, LOWEST COMMON 35370
      CPLAT   07160 07160
 OVERLAY  A     , NUMBER  08, STARTS  07157, LENGTH  00725, LOWEST COMMON 35370
      PDSUM   07160 07160
 OVERLAY  A     , NUMBER  09, STARTS  07157, LENGTH  00500, LOWEST COMMON 35370
      WROUT   07160 07160
 OVERLAY  A     , NUMBER  10, STARTS  07157, LENGTH  01414, LOWEST COMMON 35370
      TCORR   07160 07160
 OVERLAY  A     , NUMBER  11, STARTS  07157, LENGTH  00623, LOWEST COMMON 35370
      ENTH    07160 07160
 OVERLAY  A     , NUMBER  12, STARTS  07157, LENGTH  01040, LOWEST COMMON 35370
      FLOCA   07160 07160
 OVERLAY  A     , NUMBER  13, STARTS  07157, LENGTH  01303, LOWEST COMMON 35370
      FLOCB   07160 07160
 OVERLAY  A     , NUMBER  14, STARTS  07157, LENGTH  01140, LOWEST COMMON 35370
      BUBPT   10754 10754
 OVERLAY  B     , NUMBER  15, STARTS  10754, LENGTH  00341, LOWEST COMMON 35370
      DEWPT   10754 10754
 OVERLAY  B     , NUMBER  16, STARTS  10754, LENGTH  00345, LOWEST COMMON 35370
 LIBRARY ROUTINES USED
       .I3    11322 11326       ABS    11420 11430       FLOAT  11444 11444
       ALOG   11612 11614       EXP    11722 11722       OVRLAY 12106 12106
   FIRST LOCATION  NOT USED 12363, LOWEST COMMON 17737
```

APÊNDICE B

APÊNDICE B

LISTAGENS DOS PROGRAMAS PARA REGIME NÃO PERMANENTE

ÍNDICE

Página

BA - Listagem do Programa para o Método de Euler, Ex. III.2.A — B 1

BB - Listagem do Programa para o Método de Runge-Kutta, Ex. III.2.A — B11

BC - Listagem do Programa para o Método θ de Holland, Ex. III.2.A — B22

BD - Diagrama de Bloco para o Simulador Leans, elaborado para o Ex. III.2.A — B54

BE - Listagem do Programa para o Método θ de Holland, Ex. III.2.B — B56

BF - Listagem do Programa para o Método de Euler, Ex. III.2.B — B80

BG - Listagem do Programa para o Método de Runge-Kutta, Ex. III.2.B — B97

Formato A 4 - 210x297 mm

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

BA - Listagem do Programa para o Método de Euler, utilizado para o Exemplo III.2.A

Formato A 4 - 210x297 mm

```
 FORTRAN IV, CD22546.004,     JUL   1967
$JOB      NOLIST
$FORTRAN
      COMMON AK(4,4),AL(4,4),AV(4,4),TO(9)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON   NIC,NIW
      REAL     LO,KB,KAY
      REAL LF
      DATA   NOV/01,02,03,04,05,06,07,08,09,10/
      NIW = 10
      NIC = 10
      KI = 1
      KO = 1
 6000 CONTINUE
      CALL OVRLAY (NOV(01))
      CALL DATAD(IS5)
      CALL OVRLAY (NOV(02))
      CALL DOUT1
      CALL OVRLAY (NOV(03))
      CALL DOUT2
      CALL OVRLAY (NOV(04))
      CALL ONCE
 6060 FORMAT   (21H1FOR THIS RUN DELT =  ,F20.4,1H1)
      WRITE   (NIW,6060) DELT
      TIME = 0.0
      K = 0
 1000 CONTINUE
      TIME = TIME + DELT
C
      DO  30  J=2,JR
      DO  30  I=1,LC
      A(J,I) = Z(J,I) + SVO(J+1,I) + SLO(J-1,I) - SVO(J,I) - SLO(J,I)
   30 CONTINUE
      DO  31  J=2,JR
      DO  31 I=1,LC
      SUO(J,I) = SUO(J,I) + DELT*A(J,I)
   31 CONTINUE
      DO  36  J=2,JR
      SSU(J) = 0.0
      DO  36  I=1,LC
      SSU(J) = SSU(J) + SUO(J,I)
   36 CONTINUE
      DO  38  J=2,JR
      KB(J) = 0.0
      DO  37  I=1,LC
      XO(J,I) = SUO(J,I)/SSU(J)
      KB(J) = KB(J) + AK(1,I)*XO(J,I)
   37 CONTINUE
      KB(J) = 1.0 / KB(J)
   38 CONTINUE
      DO  39  J=2,JR
      DO  39  I=1,LC
      KAY(J,I) = AK(1,I) * KB(J)
      YO(J,I) = XO(J,I) * KAY(J,I)
   39 CONTINUE
      DO  40  J=2,JR
```

```
      DO  40  I=1,LC
      SVO(J,I) = VO(J) * YO(J,I)
      SLO(J,I) = LO(J) * XO(J,I)
   40 CONTINUE
      DO  440  I=L,LC
      SVO(2,I) = VO(2)*XO(2,I)
  440 CONTINUE
      K = K+1
      IF (K-K/ISS*ISS)  1000,2000,1000
 2000 CONTINUE
      CALL OVRLAY (NOV(06))
      CALL RITE1
      CALL OVRLAY (NOV(06))
      CALL RITE2
      IF (TIME-HITIME)  1000,3000,3000
 3000 CONTINUE
      IF (KO-3)  4000,4000,5000
 4000 CONTINUE
      KO = KO + 1
      GO TO 6000
 5000 CONTINUE
      CALL EXIT
      END
```

```
$OVERLAY      A
$FORTRAN
      SUBROUTINE   DATADJ(IO)
      COMMON AK(4,4),AL(4,4),AV(4,4),TO(9)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FREQ
      COMMON   ITER,LC,JT,JR,JL,JF,ISS,NOV(10)
      COMMON   NIC,NIN
      REAL     LO,KB,KAY
      REAL LF
      READ    (NIC,201)   LC,NT,NF,IREF,ISS
      IO = ISS
      READ    (NIC,202)   ((AK(K,I),K=1,4),I=1,LC)
      READ    (NIC,202)   ((AL(K,I),K=1,4),I=1,LC)
      READ    (NIC,202)   ((AV(K,I),K=1,4),I=1,LC)
      JC = 2
      JF = NF+2
      JL = NT+2
      JR = NT+3
      JT = NT+4
      READ    (NIC,202)   (TO(J),J=1,JT)
      READ    (NIC,202)   (VO(J),J=1,JT)
      READ    (NIC,202)   (LO(J),J=1,JT)
      READ    (NIC,202)   (UO(J),J=1,JT)
      READ    (NIC,202)   TF, LF, VF
      READ    (NIC,202)   D
      READ    (NIC,202)   MU, DELT, ERPHI, HITIME
      READ    (NIC,202)   TCONA, TCONB, CDOTYO, ERRUR
C
      DO  1  J=1,JT
      READ    (NIC,203)   (XO(J,I),I=1,LC)
      READ    (NIC,203)   (YO(J,I),I=1,LC)
    1 CONTINUE
      READ    (NIC,203)   (XF(I),I=1,LC)
      READ    (NIC,203)   (YF(I),I=1,LC)
C
      READ    (NIC,203)   (KB(J),J=1,JT)
C
  201 FORMAT   (10I5)
  202 FORMAT   (4E20.8)
  203 FORMAT   (8F10.0)
C
      RETURN
      END
```

```
$OVERLAY      A
$FORTRAN
      SUBROUTINE   DOUT1
      COMMON AK(4,4),AL(4,4),AV(4,4),TO(9)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSO(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON   NIC,NIN
      REAL     LO,KB,KAY
      REAL LF
  205 FORMAT  (57H1INPUT DATA     DYNAMIC DISTILLATION     HOLLANDS METH
     100 )
      WRITE   (NIN,205)
  206 FORMAT   (8HONO. OF COMPONENTS    STRIPPING PLATES     RECTIFYING    026
     1 PLATES     REFERENCE COMPONENT  ,/,(I10,I22,I21,I22))
      WRITE   (NIN,206)   LC,JL-JF,JF-2
  207 FORMAT   (20HOLIQUID FEED RATE =  ,1PE17.8, 5X,18HVAPOR FEED RATE
     1=  ,E17.8, 5X,19HFEED TEMPERATURE =  ,E17.8)
      WRITE   (NIN,207)   LF,VF,TF                                       026
  208 FORMAT   (70HOLIQUID FEED COMPOSITION      VAPOR FEED COMPOSITION   027
     1     BY COMPONENT  ,/, (1PE20.8,E28.8,(16))                        027
      WRITE   (NIN,208)   (XF(I),YF(I),I,I=1,LC)                         027
  209 FORMAT   (79HOTRAY       TEMPERATURE      VAPOR FLOW RATE      LIQU  027
     1ID FLOW RATE      HOLD UP  ,/,(I4,1PE20.6,E19.8,E22.8,E22.8))     027
      WRITE   (NIN,209)   (J-2,TO(J),VO(J),LO(J),UO(J),J=1,JT)           027
C
      RETURN                                                             027
      END
```

```
$OVERLAY      A
$FORTRAN
      SUBROUTINE   DOUT2
      COMMON AK(4,4),AL(4,4),AV(4,4),TO(9)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SL)(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON   ITER,LC,JT,JR,JL,JF,ISS,NOV(10)
      COMMON   NIC,NIN
      REAL     LO,KB,KAY
      REAL LF
  210 FORMAT   (18HOCOMPOSITIONS ,/,17X,2HC1,24X,2HC2,24X,2HC3,24X,2HC4,    030
     1 /,5H TRAY,4(6X,6HLIQUID,6X,5HVAPOR,2X),/,(I4,3X,F12.8,F12.8,F14.8    030
     2,F12.8,F14.8,F12.8,F14.8,F12.8))                                      030
      DO  211  J=1,JT                                                       030
      WRITE   (NIN,210)   J+2,(XO(J,I),YO(J,I),I=1,LC)
  211 CONTINUE                                                              030
  212 FORMAT   (22HOEQUILIBRIUM CONSTANTS,5X,5HCOMP.,12X,2HA1,15X,2HA2,1   030
     15X,2HA3,15X,2HA4,/,(2X,I3,7X,1P4E17.8))                               030
      WRITE   (NIN,212)   (I,(AK(K,I),K=1,4),I=1,LC)                        030
  213 FORMAT   (26HOLIQUID ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HC1,15X,2   031
     1HC2,15X,2HC3,15X,2HC4,/,(3IX,I3,7X,1P4E17.8))                         031
      WRITE   (NIN,213)   (I,(AL(K,I),K=1,4),I=1,LC)                        031
  214 FORMAT   (26HO VAPOR ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HE1,15X,2   031
     1HE2,15X,2HE3,15X,2HE4,/,(31X,I3,1P4E17.8))                            031
      WRITE   (NIN,214)   (I,(AV(K,I),K=1,4),I=1,LC)                        031
  215 FORMAT   (15HO KB BY TRAY  ,/,(F15.8))                                031
      WRITE   (NIN,215)   (KB(J),J=1,JT)                                    031
C
      RETURN
      END
```

```
$OVERLAY      A
$FORTRAN
      SUBROUTINE ONCE
      COMMON AK(4,4),AL(4,4),AV(4,4),TO(9)
      COMMON    TO(9),SUM(5)
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON    NIC,NIW
      REAL      LO,KB,KAY
      REAL LF
      DO  6  I=1,LC
      DO  5  J=1,JT
      SVO(J,I) = VO(J) * YO(J,I)
      SUO(J,I) = UO(J) * XO(J,I)
      SLO(J,I) = LO(J) * XO(J,I)
    5 CONTINUE
      SLO(1,I) = 0.0
      SVO(JT,I) = 0.0
    6 CONTINUE
C
C
      DO  3  J=1,JT
      DO  3  I=1,LC
      Z(J,I) = 0.0
    3 CONTINUE
C
      FEED = LF + VF
      DO  4  I=1,LC
      Z(JF-1) = YF(I) * VF
      Z(JF,I) = XF(I) * LF
    4 CONTINUE
C
      RETURN
      END
```



```
$OVERLAY     A
$FORTRAN
      SUBROUTINE    RITE1
      COMMON AK(4,4),AL(4,4),AV(4,4),TO(9)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON   ITER,LC,JF,JR,JL,JF,IS5,NOV(10)
      COMMON   NIC,NIW
      REAL     LO,KB,KAY
      REAL LF
  274 FORMAT   (12H1PROBLEM NO.,/, 7HTIME = ,F10.3,          55HOLIQUID M   120
     1OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)
      WRITE    (NIW,274)   TIME
  276 FORMAT   (21HO       BOTTOM PRODUCT,/,(5E20.8))
      WRITE    (NIW,276)   (XO(JR,I),I=1,LC)
  277 FORMAT   (19HO       PLATE NO. = ,I3,/,(5E20.8))
      DO  71  K=3,JL
      JPLATE = K-2
      J = JL-K+3
      WRITE    (NIW,277)   JPLATE,(XO(J,I),I=1,LC)
   71 CONTINUE
  279 FORMAT   (15HO       REFLUX, /,(5E20.8))
      WRITE    (NIW,279)   (XO(2,I),I=1,LC)
  280 FORMAT   (16HO       TOP PRODUCT,/,(5E20.8))
      WRITE    (NIW,280)   (XO(2,I),I=1,LC)
  281 FORMAT   (34HOBOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))
      WRITE    (NIW,281)   (LO(JR)*XO(JR,I)/( XF(I)*FEED),I=1,LC)          1
  282 FORMAT   (31HOTOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))
      WRITE    (NIW,282)   (LO( 2)*XO( 2,I)/( XF(I)*FEED),I=1,LC)
  292 FORMAT   (62HOSUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEA
     1DY STATE    ,/,(5E20.8),/)
      WRITE    (NIW,292)  ((LO(JR)*XO(JR,I) + LO(2)*XO(2,I))/(XF(I)*FEED)
     1,I=1,LC)
  283 FORMAT   (27HOMOLES OF FEED AND PRODUCTS)
      WRITE    (NIW,283)
  284 FORMAT   (70HO      COMPONENT           FEED          BOTTOM PRODUCT    130
     1      TOP PRODUCT,/,(I11,E22.8,2E19.8))
      WRITE(NIW,284) (I,XF(I)*FEED,XO(JR,I)*LO(JR),XO(2,I)*LO(2),I=1,LC)
C
      RETURN
      END
```

```
$OVERLAY      A
$FORTRAN
      SUBROUTINE   RITE2
      COMMON AK(4,4),AL(4,4),AV(4,4),TO(9)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON   ITER,LC,JT,JR,JL,JF,ISS,NOV(10)
      COMMON   NIC,NIP
      REAL     LO,KB,KAY
      REAL LF
  285 FORMAT   (2H  ,/,E33.8,2E19.8)
      WRITE    (NIW,285)   FEED,LO(JR),LO(2)
      DO  72  J=1,JT
      SUM(J) = 0.0
      DO  72  I=1,LC
      SUM(J) = SUM(J) + XO(J,I)
   72 CONTINUE
  286 FORMAT   (16HOPLATE VARIABLES)
      WRITE    (NIW,286)
  287 FORMAT   (115HO        SUMMATIONS          TEMPERATURES        VAPOR F    L33
     1LOWS          LIQUID FLOWS     VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,    L34
     2 (4E19.8))
      WRITE    (NIW,287)   (SUM(J),TO(J),VO(J),LO(J),J=2,JR)
C
      RETURN
      END
```

```
$DATA
   ROUTINE   RELOC ENTRY   ROUTINE   RELOC ENTRY   ROUTINE   RELOC ENTRY   ROU
     NAME    FACTOR POINT    NAME    FACTOR POINT    NAME    FACTOR POINT    N
      ,RF     06000 06000
      DATAD   07342 07342
 OVERLAY  A     , NUMBER  01, STARTS  07341, LENGTH  01014, LOWEST COMMON 36250
      DOUT1   07342 07342
 OVERLAY  A     , NUMBER  02, STARTS  07341, LENGTH  00601, LOWEST COMMON 36250
      DOUT2   07342 07342
 OVERLAY  A     , NUMBER  03, STARTS  07341, LENGTH  00574, LOWEST COMMON 36250
      ONCE    07342 07342
 OVERLAY  A     , NUMBER  04, STARTS  07341, LENGTH  00463, LOWEST COMMON 36250
      RITE1   07342 07342
 OVERLAY  A     , NUMBER  05, STARTS  07341, LENGTH  01275, LOWEST COMMON 36250
      RITE2   07342 07342
 OVERLAY  A     , NUMBER  06, STARTS  07341, LENGTH  00432, LOWEST COMMON 36250
LIBRARY ROUTINES USED
      ,RI     10640 10640      ,WO     10640 10710      OVRLAY 10775 10776
   FIRST LOCATION  NOT USED 11203, LOWEST COMMON 36250
```

BB - Listagem do Programa para o Método de Runge-Kutta, utilizado para o Exemplo III.2.A

```
$FORTRAN IV, CD22546,004,    JUL   1967
$JOB      NOLIST
$FORTRAN
      COMMON    D,TF,AL(4,4),AV(4,4)
      COMMON    TO(9),SUM(9)
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON    S(9,4)
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON    NIC,NIW
      REAL      LO,KB,KAY
      REAL LF
      REAL   K1,K2,K3
      DIMENSION F1(9,4),F2(9),F3(9)
      DIMENSION   K1(9,4),K2(9,4),K3(9,4)
      REAL   K4
      DATA   NOV/01,02,03,04,05,06,07,08,09,10/
      NIW = 10
      NIW = 10
      KI = 1
      KO = 1
 6000 CONTINUE
      CALL OVRLAY (NOV(01))
      CALL DATAD(IS5)
      CALL OVRLAY (NOV(02))
      CALL DOUT1
      CALL OVRLAY (NOV(03))
      CALL DOUT2
      CALL OVRLAY (NOV(04))
      CALL ONCE
      DELT = DELT/FLOAT(KI)
 6060 FORMAT   (21H1FOR THIS RUN DELT =  ,F20,4,1H1)
      WRITE   (NIW,6060) DELT
      TIME = 0,0
      K = 0
 1000 CONTINUE
      TIME = TIME + DELT
C
      DO  10  J=2,JR
      DO  9  I=1,LC
      F1(J,I) = LO(J+1) * S(J+1,I) / UO(J+1)
    9 CONTINUE
      F2(J) = LO(J-1)/UO(J-1)
      F3(J) = LO(J)/UO(J)
C
   10 CONTINUE
      DO  12  I=1,LC
      DO  11 J=2,JR
      K1(J,I) = DELT*(Z(J,I) + F1(J,I)*SUO(J+1,I) + F2(J)*SUO(J-1,I) *
     1   F3(J) * (S(J,I) + 1,0)*SUO(J,I))
   11 CONTINUE
      K1(JT,I) = 0,0
      K1(1,I) = 0,0
   12 CONTINUE
C
      DO  14  I=1,LC
      DO  13  J=2,JR
      K2(J,I) = DELT*(Z(J,I) + F1(J,I)*(SUO(J+1,I)+K1(J+1,I)/2,0) + F2(J
     1)*(SUO(J-1,I) + K1(J-1,I)/2,0) - F3(J)*(SUO(J,I)+K1(J,I)/2,0)*(S(J
```

```
     2,I)+1,0)]
  13 CONTINUE
     K2(JT,I) = 0.0
     K2(1,I) = 0.0
  14 CONTINUE
     DO  16  I=1,LC
     DO  15  J=2,JR
     K3(J,I) =DELT*(Z(J,I) + F1(J,I) *(SUO(J+1,I)+K2(J+1,I)/2.0) + F2(J
     1)*(SUO(J-1,I)+K2(J-1,I)/2.0) - F3(J)*(SUO(J,I)+K2(J,I)/2.0)*(S(J,I
     2)+1.0))
  15 CONTINUE
     K3(JT,I) = 0.0
     K3(1,I) = 0.0
  16 CONTINUE
     DO  18  I=1,LC
     DO  18  J=2,JR
     K4      =DELT*(Z(J,I) + F1(J,I) *(SUO(J+1,I)+K3(J+1,I)    ) + F2(J
     1)*(SUO(J-1,I)+K3(J-1,I)    ) - F3(J)*(SUO(J,I)+K3(J,I)    )*(S(J,I
     2)+1.0))
     SUO(J,I) = SUO(J,I) + (K1(J,I) + 2.0*(K2(J,I)+K3(J,I)) + K4)/6.0
  18 CONTINUE
     DO  36  J=2,JR
     SSU(J) = 0.0
     DO  36  I=1,LC
     SSU(J) = SSU(J) + SUO(J,I)
  36 CONTINUE
     DO  38  J=2,JR
     KB(J) = 0.0
     DO  37  I=1,LC
     XO(J,I) = SUO(J,I)/SSU(J)
     KB(J) = KB(J) + AK(1,I)*XO(J,I)
  37 CONTINUE
     KB(J) = 1.0 / KB(J)
  38 CONTINUE
     DO  39  J=2,JR
     DO  39  I=1,LC
     KAY(J,I) = AK(1,I) * KB(J)
     S(J,I) =  VO(J) * KAY(J,I)/LO(J)
     YO(J,I) = XO(J,I) * KAY(J,I)
  39 CONTINUE
     DO  40  J=2,JR
     DO  40  I=1,LC
     SVO(J,I) = VO(J) * YO(J,I)
     SLO(J,I) = LO(J) * XO(J,I)
  40 CONTINUE
     DO  440  I=1,LC
     S(2,I) = D/LO(2)
     SVO(2,I) = VO(2)*XO(2,I)
 440 CONTINUE
     K = K+1
     IF (K-K/KI*KI)  1000,2000,1000
2000 CONTINUE
     CALL OVRLAY (NOV(05))
     CALL RITE1
     CALL OVRLAY (NOV(06))
     CALL RITE2
     IF (TIME-HITIME)  1000,3000,3000
3000 CONTINUE
     IF (KO-3)  4000,4000,5000
4000 CONTINUE
```

```
      KO = KO + 1
      KI = KI*2
      GO TO 6000
      CALL EXIT
5000  CONTINUE
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DATAD(IO)
      COMMON     D,TF,AL(4,4),AV(4,4)
      COMMON    TO(9),SUM(9)
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON    S(9,4)
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON    NIC,NIW
      REAL      LO,KB,KAY
      REAL LF
      READ     (NIC,201)    LC,NT,NF,IREF,IS5
      IO = IS5
      READ     (NIC,202)    ((AK(K,I),K=1,4),I=1,LC)
      READ     (NIC,202)    ((AL(K,I),K=1,4),I=1,LC)
      READ     (NIC,202)    ((AV(K,I),K=1,4),I=1,LC)
      JC = 2
      JF = NF+2
      JL = NT+2
      JR = NT+3
      JT = NT+4
      READ     (NIC,202)    (TO(J),J=1,JT)
      READ     (NIC,202)    (VO(J),J=1,JT)
      READ     (NIC,202)    (LO(J),J=1,JT)
      READ     (NIC,202)    (UO(J),J=1,JT)
      READ     (NIC,202)    TF, LF, VF
      READ      (NIC,202)    D
      READ      (NIC,202)    MU, DELT, ERPHI, HITIME
      READ      (NIC,202)    TCONA, TCONB, CDUTYO, ERSUB
C
      DO  1  J=1,JT
      READ     (NIC,203)    (XO(J,I),I=1,LC)
      READ     (NIC,203)    (YO(J,I),I=1,LC)
    1 CONTINUE
      READ     (NIC,203)    (XF(I),I=1,LC)
      READ     (NIC,203)    (YF(I),I=1,LC)
C
      READ     (NIC,203)    (KB(J),J=1,JT)
C
  201 FORMAT    (10I5)
  202 FORMAT    (4E20.8)
  203 FORMAT    (8F10.0)
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DOUT1
      COMMON     D,TF,AL(4,4),AV(4,4)
      COMMON    TO(9),SUM(9)
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON    S(9,4)
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON    NIC,NIW
      REAL      LO,KB,KAY
      REAL LF
  205 FORMAT  (57H1INPUT DATA      DYNAMIC DISTILLATION      HOLLANDS METH
     1OD )
      WRITE   (NIW,205)
  206 FORMAT   (86H0NO. OF COMPONENTS    STRIPPING PLATES     RECTIFYING    026
     1 PLATES      REFERENCE COMPONENT  ,/,(I10,I22,I21,I22))
      WRITE   (NIW,206)   LC,JL-JF,JF-2
  207 FORMAT   (20H0LIQUID FEED RATE =  ,1PE17.8, 5X,18HVAPOR FEED RATE
     1=  ,E17.8, 5X,19HFEED TEMPERATURE =  ,E17.8)
      WRITE   (NIW,207)   LF,VF,TF                                        026
  208 FORMAT   (70H0LIQUID FEED COMPOSITION       VAPOR FEED COMPOSITION   027
     1     BY COMPONENT  ,/, (1PE20.8,E28.8,I16))                         027
      WRITE   (NIW,208)   (XF(I),YF(I),I,I=1,LC)                          027
  209 FORMAT   (79H0TRAY      TEMPERATURE      VAPOR FLOW RATE      LIQU   027
     1ID FLOW RATE      HOLD UP  ,/,(I4,1PE20.6,E19.8,E22.8,E22.8))      027
      WRITE   (NIW,209)   (J=2,TO(J),VO(J),LO(J),UO(J),J=1,JT)            027
C
      RETURN                                                              027
      END                                                                 027
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DOUT2
      COMMON    D,TF,AL(4,4),AV(4,4)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON   S(9,4)
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON   NIC,NIW
      REAL     LO,KB,KAY
      REAL LF
  210 FORMAT   (13H0COMPOSITIONS ,/,17X,2HC1,24X,2HC2,24X,2HC3,24X,2HC4,    030
     1 /,5H TRAY,4(6X,6HLIQUID,6X,5HVAPOR,2X),/,(I4,3X,F12.8,F12.8,F14.8    030
     2,F12.8,F14.8,F12.8,F14.8,F12.8))                                      030
      DO  211  J=1,JT
      WRITE   (NIW,210)   J,(XO(J,I),YO(J,I),I=1,LC)
  211 CONTINUE
  212 FORMAT   (22H0EQUILIBRIUM CONSTANTS,5X,5HCOMP,,12X,2HA1,15X,2HA2,1    030
     15X,2HA3,15X,2HA4,/,(27X,I3,7X,1P4E17.8))                              030
      WRITE   (NIW,212)   (I,(AK(K,I),K=1,4),I=1,LC)                        030
  213 FORMAT   (26H0LIQUID ENTHALPY CONSTANTS ,5X,5HCOMP,,12X,2HC1,15X,2    031
     1HC2,15X,2HC3,15X,2HC4,/,(31X,I3,7X,1P4E17.8))                         031
      WRITE   (NIW,213)   (I,(AL(K,I),K=1,4),I=1,LC)                        031
  214 FORMAT   (26H0 VAPOR ENTHALPY CONSTANTS ,5X,5HCOMP,,12X,2HE1,15X,2    031
     1HE2,15X,2HE3,15X,2HE4,/,(31X,I3,1P4E17.8))                            031
      WRITE   (NIW,214)   (I,(AV(K,I),K=1,4),I=1,LC)                        031
  215 FORMAT   (13H0 KB BY TRAY  ,/,(F13.8))                                031
      WRITE   (NIW,215)   (KB(J),J=1,JT)                                    031
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE ONCE
      COMMON     D,TF,AL(4,4),AV(4,4)
      COMMON    TO(9),SUM(9)
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON    S(9,4)
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON    NIC,NIW
      REAL      LO,KB,KAY
      REAL LF
      DO   6 I=1,LC
      DO   5  J=2,JR
      SVO(J,I) = VO(J) * YO(J,I)
      SUO(J,I) = UO(J) * XO(J,I)
      SLO(J,I) = LO(J) * XO(J,I)
      KAY(J,I) = AK(1,I)*KB(J)
      S(J,I) = VO(J)*KAY(J,I)/LO(J)
    5 CONTINUE
      SLO(1,I) = 0.0
      SVO(JT,I) = 0.0
      SUO(1,I) = 0.0
      SUO(JT,I) = 0.0
      S(JT,I) = 0.0
      S(1,I) = 0.0
      S(2,I) = D/LO(2)
    6 CONTINUE
C
      DO   3  J=1,JT
      DO   3  I=1,LC
      Z(J,I) = 0.0
    3 CONTINUE
C
      FEED = LF + VF
C
      DO   4  I=1,LC
      Z(JF-1,I) = YF(I) * VF
      Z(JF,I) = XF(I) * LF
    4 CONTINUE
C
      LO(1) = 0.0
      LO(JT) = 0.0
      UO(JT) = 1.0
      UO(1) = 1.0
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE    RITE1
      COMMON    D,TF,AL(4,4),AV(4,4)
      COMMON    TO(9),SUM(9)
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON    S(9,4)
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON    NIC,NIW
      REAL      LO,KB,KAY
      REAL LF
  274 FORMAT    (12H1PROBLEM NO.,/, 7HTIME = ,F10.3,          53HOLIQUID M   128
     1OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)
      WRITE     (NIW,274)    TIME
  276 FORMAT    (21HO        BOTTOM PRODUCT,/,(5E20.8))
      WRITE     (NIW,276)    (XO(JR,I),I=1,LC)
  277 FORMAT    (19HO        PLATE NO. = ,I3,/,(5E20.8))
      DO  71  K=3,JL
      JPLATE = K-2
      J = JL-K+3
      WRITE     (NIW,277)    JPLATE,(XO(J,I),I=1,LC)
   71 CONTINUE
  279 FORMAT    (13HO        REFLUX, /,(5E20.8))
      WRITE     (NIW,279)    (XO(2,I),I=1,LC)
  280 FORMAT    (18HO        TOP PRODUCT,/,(5E20.8))
      WRITE     (NIW,280)    (XO(2,I),I=1,LC)
  281 FORMAT    (34HOBOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))          1
      WRITE     (NIW,281)    (LO(JR)*XO(JR,I)/( XF(I)*FEED),I=1,LC)        1
  282 FORMAT    (31HOTOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))
      WRITE     (NIW,282)    (LO(2)*XO(2,I)/(XF(I)*FEED),I=1,LC)
  292 FORMAT    (62HOSUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEA
     1DY STATE    ,/,(5E20.8),/)
      WRITE     (NIW,292)  ((LO(JR)*XO(JR,I) + LO(2)*XO(2,I))/(XF(I)*FEED)
     1,I=1,LC)
  283 FORMAT    (27HOMOLES OF FEED AND PRODUCTS)
      WRITE     (NIW,283)
  284 FORMAT    (70HO      COMPONENT           FEED          BOTTOM PRODUCT    130
     1      TOP PRODUCT,/,(I11,E22.8,2E19.8))
      WRITE(NIW,284) (I,XF(I)*FEED,XO(JR,I)*LO(JR),XO(2,I)*LO(2),I=1,LC)
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   RITE2
      COMMON    D,TF,AL(4,4),AV(4,4)
      COMMON   TO(9),SUM(9)
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED
      COMMON   S(9,4)
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)
      COMMON   NIC,NIW
      REAL     LO,KB,KAY
      REAL LF
  285 FORMAT   (2H  ,/,E33.8,2E19.8)
      WRITE   (NIW,285)   FEED,LO(JR),LO(2)
      DO  72  J=1,JT
      SUM(J) = 0.0
      DO  72  I=1,LC
      SUM(J) = SUM(J) + XO(J,I)
   72 CONTINUE
  286 FORMAT   (16H0PLATE VARIABLES)
      WRITE   (NIW,286)
  287 FORMAT   (115H0       SUMMATIONS         TEMPERATURES        VAPOR F    133
     1LOWS         LIQUID FLOWS    VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,    134
     2 (4E19.8))
      WRITE   (NIW,287)   (SUM(J),TO(J),VO(J),LO(J),J=2,JR)
C
      RETURN
      END
```

```
$DATA
   ROUTINE   RELOC ENTRY    ROUTINE   RELOC ENTRY    ROUTINE   RELOC ENTRY    ROU
     NAME    FACTOR POINT      NAME   FACTOR POINT      NAME   FACTOR POINT      N
      ,KP    06000 06000
      DATAD  11412 11412
 OVERLAY  A     , NUMBER  01, STARTS  11411, LENGTH  01016, LOWEST COMMON 36134
      DOUT1  11412 11412
 OVERLAY  A     , NUMBER  02, STARTS  11411, LENGTH  00603, LOWEST COMMON 36134
      DOUT2  11412 11412
 OVERLAY  A     , NUMBER  03, STARTS  11411, LENGTH  00675, LOWEST COMMON 36134
      ONCE   11412 11412
 OVERLAY  A     , NUMBER  04, STARTS  11411, LENGTH  00727, LOWEST COMMON 36134
      RITE1  11412 11412
 OVERLAY  A     , NUMBER  05, STARTS  11411, LENGTH  01277, LOWEST COMMON 36134
      RITE2  11412 11412
 OVERLAY  A     , NUMBER  06, STARTS  11411, LENGTH  00433, LOWEST COMMON 36134
LIBRARY ROUTINES USED
      FLOAT  12712 12712       ,RI    12722 12722       ,WO    12722 12772
   FIRST LOCATION  NOT USED 13265, LOWEST COMMON 36134
```

BC - Listagem do Programa para o Método θ de Holland, utilizado para o Exemplo III.2.A

```
$ FORTRAN IV, CD22546.004,    JUL   1967
$JOB      NOLIST
$FORTRAN
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZU(9,4)
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON   AL(4,4)
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),JO(09),U(09),F(09)
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),K3(09)
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SUO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPRI
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERROR
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,ISS
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL      LFO
      DIMENSION   LJUNK(6),MJUNK(6)
      DIMENSION   NOV(30)
      DATA      NOV/01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18
     1,           15,16,17,18,23,24,25,26,27,28,29,30/
C     DATA      NOV/01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18
C    1,           19,20,21,22,23,24,25,26,27,28,29,30/
      NIC = 10
      NIW = 10
C
C     MAIN LINE
C
C
C     OVERLAY DIRECTORY
C
C          SUBSCRIPT (K) OF NOV INDICATES THE SUBROUTINE NAME
C
C          THE VALUE OF NOV(K) INDICATES THE PHYSICAL ORDER OF
C           APPEARANCE IN THE DECK
C
C                NOV(01) = DATAD
C                NOV(02) = DOUT1
C                NOV(03) = DOUT2
C                NOV(04) = ONCE
C                NOV(05) = BEGINT
C                NOV(06) = THETAT
C                NOV(07) = DORAT
C                NOV(08) = CORDEE
C                NOV(09) = THET
C                NOV(10) = TIGHT
C                NOV(11) = MINV
C                NOV(12) = LOOSE
C                NOV(13) = THETAF
C                NOV(14) = TEMPRO
C                NOV(15) = ENTHAL
C                NOV(16) = ENTHA2
C                NOV(17) = LCORR
C                NOV(18) = LCORR2
C                NOV(19) = PREDIC
C                NOV(20) = RITE1
C                NOV(21) = RITE2
```

```
C                NOV(22) = NEWTIM
C
C
C
 1000 CONTINUE
      CALL OVRLAY(NOV(01))
      CALL DATAD (IS5)
      CALL OVRLAY(NOV(02))
      CALL DOUT1
      CALL OVRLAY(NOV(03))
      CALL DOUT2
      CALL OVRLAY(NOV(04))
      CALL ONCE
 2000 CONTINUE
      CALL OVRLAY(NOV(05))
      CALL BEGINT
 3000 CONTINUE
      CALL OVRLAY(NOV(06))
      CALL THETAT
      CALL OVRLAY(NOV(07))
      CALL DORAT
      CALL OVRLAY(NOV(08))
      CALL CORDEE
      CALL OVRLAY(NOV(09))
      CALL THET
      CALL OVRLAY(NOV(10))
      CALL TIGHT
      CALL OVRLAY(NOV(11))
      CALL MINV (DSC,JL-1,RES,MJUNK,LJUNK)
      CALL OVRLAY(NOV(12))
      CALL LOOSE
      CALL OVRLAY(NOV(13))
      CALL THETAF
      CALL OVRLAY(NOV(14))
      CALL TEMPRO
      GO TO 1111
 1111 CONTINUE
      CALL OVRLAY(NOV(19))
      CALL PREDIC (ITER)
C
      IF (IS5)  3500,3500,3400
 3400 CONTINUE
      CALL OVRLAY(NOV(20))
      CALL RITE1
      CALL OVRLAY(NOV(21))
      CALL RITE2
C
 3500 CONTINUE
      IF (ITER-5)  3000,3000,4000
 4000 CONTINUE
      IF (IDIR)  7000,5000,6000
 5000 CONTINUE
      IF(ITER - 10) 3000,6000,6000
C
 6000 CONTINUE
      IF (IS5)  9000,9000,9500
 9000 CONTINUE
      CALL OVRLAY (NOV(20))
      CALL RITE1
      CALL OVRLAY (NOV(21))
```

```
      CALL RITE2
 9500 CONTINUE
      CALL OVRLAY(NOV(22))
      CALL NEWTIM
      GO TO 2000
C
 7000 CONTINUE
      IF (ISS)  8000,8000,1000
 8000 CONTINUE
      CALL OVRLAY(NOV(20))
      CALL RITE1
      CALL OVRLAY(NOV(21))
      CALL RITE2
      GO TO 1000
C
      END
```

```
$BINARY
$FORTRAN
      FUNCTION   EQUILK(AK,I,T)
      DIMENSION      AK(4,4)
      EQUILK = AK(1,I) * T
C
      RETURN
      END
```

```
$FORTRAN
      FUNCTION    THALP(AZ,Q,I)
      DIMENSION       AZ(4,4)
      T = Q+459,69
      Z       = (((AZ(4,I)*T+AZ(3,I))*T+AZ(2,I))*T+AZ(1,I))
      THALP = Z*Z
C
      RETURN
      END
```

```
$FORTRAN
      FUNCTION   CORECD(I)
      COMMON     TFD,LFD,VFD,XFD(4),YFD(4),ZD(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERRUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL      LFD
      CORECD = (FEED*CXF(I) + SIG*(FEED*CXFO(I)-SDO(I)-SBO(I)) + SSU(I)/
     1         FAC) / (1.0 + THETA(1)*SBODCA(I)*(1.0+U(JR)/FAC/L(JR)) +
     2         SSUTHD(I)/FAC)
C
C
      RETURN
      END
```

```
$FORTRAN
      SUBROUTINE EFF(J,T)
      EFF = 1.0
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DATAD(IO)
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      READ     (NIC,201)    LC,NT,NF,IREF,IS5
      IO = IS5
      READ     (NIC,202)    ((AK(K,I),K=1,4),I=1,LC)
      READ     (NIC,202)    ((AL(K,I),K=1,4),I=1,LC)
      READ     (NIC,202)    ((AV(K,I),K=1,4),I=1,LC)
      JC = 2
      JF = NF+2
      JL = NT+2
      JR = NT+3
      JT = NT+4
      READ     (NIC,202)    (TO(J),J=1,JT)
      READ     (NIC,202)    (VO(J),J=1,JT)
      READ     (NIC,202)    (LO(J),J=1,JT)
      READ     (NIC,202)    (UO(J),J=1,JT)
      READ     (NIC,202)    TFO,LFO,VFO
      READ     (NIC,202)    TF, LF, VF
      READ      (NIC,202)    D
      READ      (NIC,202)    MU, DELT, ERPHI, HITIME
      READ      (NIC,202)    TCONA, TCONB, CDUTYO, ERBUB
C
      DO  1  J=1,JT
      READ      (NIC,203)    (XO(J,I),I=1,LC)
      READ      (NIC,203)    (YO(J,I),I=1,LC)
    1 CONTINUE
      READ     (NIC,203)    (XFO(I),I=1,LC)
      READ     (NIC,203)    (YFO(I),I=1,LC)
      READ      (NIC,203)    (XF(I),I=1,LC)
      READ      (NIC,203)    (YF(I),I=1,LC)
C
      READ      (NIC,203)    (KB(J),J=1,JT)
C
  201 FORMAT    (10I5)
  202 FORMAT    (4E20.8)
  203 FORMAT    (8F10.0)
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DOUT1
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),PO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),JO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHO(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERROR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL      LFO
  205 FORMAT  (57H1INPUT DATA      DYNAMIC DISTILLATION      HOLLANDS METH
     10D )
      WRITE   (NIW,205)
  206 FORMAT   (86HONO. OF COMPONENTS     STRIPPING PLATES      RECTIFYING
     1 PLATES      REFERENCE COMPONENT  ,/,(I10,I22,I21,I22))
      WRITE   (NIW,206)   LC,JL-JF,JF-2,IREF
  207 FORMAT   (20HOLIQUID FEED RATE =  ,1PE17.8, 5X,19HVAPOR FEED RATE
     1=  ,E17.8, 5X,19HFEED TEMPERATURE =  ,F17.8)
      WRITE   (NIW,207)   LF,VF,TF
  208 FORMAT   (70HOLIQUID FEED COMPOSITION      VAPOR FEED COMPOSITION
     1      BY COMPONENT  ,/, (1PE20.8,E28.8,I16))
      WRITE   (NIW,208)   (XF(I),YF(I),I,I=1,LC)
  209 FORMAT   (79HOTRAY      TEMPERATURE      VAPOR FLOW RATE      LIQU
     1ID FLOW RATE      HOLD UP  ,/,(I4,1PE20.6,E19.8,E22.8,E22.8))
      WRITE   (NIW,209)   (J-2,TO(J),VO(J),LO(J),JO(J),J=1,JT)
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DOUT2
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SUO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERROR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
  210 FORMAT   (13HOCOMPOSITIONS ,/,17X,2HC1,24X,2HC2,24X,2HC3,24X,2HC4,
     1 /,5H TRAY,4(6X,6HLIQUID,6X,5HVAPOR,2X),/,(I4,3X,F12.8,F12.8,F14.8
     2,F12.8,F14.8,F12.8,F14.8,F12.8))
      DO  211  J=1,JT
      WRITE   (NIW,210)   J,(XO(J,I),YO(J,I),I=1,LC)
  211 CONTINUE
  212 FORMAT   (22HOEQUILIBRIUM CONSTANTS,5X,5HCOMP,,12X,2HA1,15X,2HA2,1
     15X,2HA3,15X,2HA4,/,(27X,I3,7X,1P4E17.8))
      WRITE   (NIW,212)   (I,(AK(K,I),K=1,4),I=1,LC)
  213 FORMAT   (26HOLIQUID ENTHALPY CONSTANTS ,5X,5HCOMP,,12X,2HC1,15X,2
     1HC2,15X,2HC3,15X,2HC4,/,(31X,I3,7X,1P4E17.8))
      WRITE   (NIW,213)   (I,(AL(K,I),K=1,4),I=1,LC)
  214 FORMAT   (26HO VAPOR ENTHALPY CONSTANTS ,5X,5HCOMP,,12X,2HE1,15X,2
     1HE2,15X,2HE3,15X,2HE4,/,(31X,I3,1P4E17.8))
      WRITE   (NIW,214)   (I,(AV(K,I),K=1,4),I=1,LC)
  215 FORMAT   (15HO KB BY TRAY  ,/,(F12.8))
      WRITE   (NIW,215)   (KB(J),J=1,JT)
C     DO 111  J=2,JR
C      DO 111  I=1,LC
C     YO(J,I) =EQUILK(AK,I,TO(J)) * XO(J,I)
C 111 CONTINUE
C
C
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE ONCE
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLOPCA(09,4)
      COMMON    SVOPCA(09,4),SUOPCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,RITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      DO  2  J=1,JT
      T(J) = TO(J)
      L(J) = LO(J)
      V(J) = VO(J)
      U(J) = UO(J)
    2 CONTINUE
C
      DO  3 J=1,JT
      DO  3  I=1,LC
      ZO(J,I) = 0.0
      Z(J,I) = 0.0
    3 CONTINUE
C
      FEED = LF + VF
      LZ = LO(2)
C
      DO  4  I=1,LC
      ZO(JF-1,I) = YFO(I) * VFO
      ZO(JF,I) = XFO(I)*LFO
      Z(JF-1,I) = YF(I) * VF
      Z(JF,I) = XF(I) * LF
      CXF(I)  = (Z(JF-1,I) + Z(JF,I)) / FEED
      CXFO(I) = (ZO(JF-1,I)+ZO(JF,I))/FEED
    4 CONTINUE
C
      SIG  =  (1.0-MU)/MU
C
      DO  400  I=1,LC
      SVO(JT,I) = 0.0
      AO(1,I) = 0.0
      SVO(1,I) = 0.0
  400 CONTINUE
C
      DO  6  J=2,JR
      DO  5  I=1,LC
      SVO(J,I) = VO(J)*YO(J,I)
      SUO(J,I) = UO(J) * XO(J,I)
      SLO(J,I) = LO(J) * XO(J,I)
    5 CONTINUE
```

```
      TAUO(J) = UO(J)/LO(J)/DELT
    6 CONTINUE
C
      DO  7  I=1,LC
      SDO(I) = SVO(2,I)
      SBO(I) = SLO(JR,I)
    7 CONTINUE
C
      KTIM = 1
      TIME = DELT
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE BEGINT
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,MITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      DO  8  J=2,JR
      LOV = LO(J)/VO(J)
      DO  8  I=1,LC
      IF (J-2)  7,6,7
    6 AO(2,I) = LO(2)/D
      GO TO 9
    7 CONTINUE
      AO(J,I) = LOV/EQUILK(AK,I,KB(J))
C     AO(J,I) = LOV/EQUILK(AK,I,TO(J))
    9 CONTINUE
      P(J,I) = Z(J,I) + SIG*(ZO(J,I)+ SVO(J+1,I) - (AO(J,I) + 1.0)*SVO(J
     1,I) + AO(J-1,I)*SVO(J-1,I)) + TAUO(J)*AO(J,I)*SVO(J,I)/MU
    8 CONTINUE
C
      ITER = 0
      FAC = MU * DELT
C
      DO  17 J=1,JT
      THETA(J) = 1.0
   17 CONTINUE
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   THETAT
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    ZI(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),JO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      DO  10  J=2,JR
      LOV = L(J)/V(J)
      TAU(J) = U(J)/L(J)/DELT
      DO  9  I=1,LC
      A(J,I) = LOV/EQUILK(AK,I,KB(J))
C     A(J,I) = LOV/EQUILK(AK,I,T(J))
      RO(J,I) = 1.0 + A(J,I) * (1.0 + TAU(J)/MU)
    9 CONTINUE
   10 CONTINUE
      DO  11  I=1,LC
      A(2,I) = L(2)/D
      RO(2,I) = 2.0 + TAU(2)/MU
   11 CONTINUE
C
      RETURN
      END
```



```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   DORAT
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPMI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERRUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      F(1) = 0.0
      G(1) = 0.0
      DO  13  I=1,LC
      DO  11  J=2,JR
      F(J) = 1.0/(-RO(J,I) + A(J-1,I)*F(J-1))
C WOULD BLOW UP IF DENOMENATOR OF F(JR) = 0.0
      G(J) = (-P(J,I) + A(J-1,I)*G(J-1))/(-RO(J,I) + A(J-1,I)*F(J-1))
   11 CONTINUE
C
      F(JR) = 0.0
      SV(JT,I) = 0.0
C
      DO  12  JJ=2,JR
      J = JT-JJ+1
      SV(J,I) = G(J) + F(J)*SV(J+1,I)
   12 CONTINUE
C
   13 CONTINUE
C
C
      DO  14  I=1,LC
      SDCA(I) = SV(2,I)
      SBCA(I) = A(JR,I)*SV(JR,I)
      SBODCA(I) = SBCA(I)/SDCA(I)
   14 CONTINUE
C
      DO  15  I=1,LC
      DO  15  J=2,JR
      SVODCA(J,I) = SV(J,I)/SDCA(I)
      SLODCA(J,I) = SVODCA(J,I)*A(J,I)
      SUODCA(J,I) = SLODCA(J,I)*U(J)/L(J)
   15 CONTINUE
C
      DO  16  I=1,LC
      SUODCA(1,I) = 0.0
   16 CONTINUE
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   CORDEE
      COMMON     TFO,LFO,VFO,XFO[4],YFO[4],ZO[9,4]
      COMMON    DGE[09,09],DGC[06,06],H[11,09],HF[6],AK[4,4],AV[4,4]
      COMMON    AL[4,4]
      COMMON    SVO[09,4],SV[09,4],AO[09,4],A[09,4],SUO[09,4],SUCO[09,4]
      COMMON    Z[09,4],SLO[09,4],SL[09,4],P[09,4],RO[09,4],ISUCO[09,4]
      COMMON    XO[09,4],X[09,4],YO[09,4],Y[09,4],SLODCA[09,4]
      COMMON    SVODCA[09,4],SUODCA[09,4],KAY[09,4]
      COMMON    TO[09],T[09],LO[09],L[09],VO[09],V[09],JO[09],U[09],F[09]
      COMMON    G[09],TAUO[09],TAU[09],THETA[09],SSUCO[09],GE[09],IGE[09]
      COMMON    DELTH[09],ISSUCO[09],DTHETA[09],KB[09]
      COMMON    CXFO[4],CXF[4],XF[4],YF[4],SDO[4],SDCO[4],SBO[4],SBCA[4]
      COMMON    SDCA[4],SBODCA[4],SSU[4],SSUTHD[4],ISDCO[4]
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERROR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      DO  18  I=1,LC
      SSU[I] = SUO[JR,I] + SUO[2,I]
      SSUTHD[I] = U[2]/D
      DO  18  J=3,JL
      SSU[I] = SSU[I] + SJO[J,I]
      SSUTHD[I] = SSUTHD[I] + SUODCA[J,I]*THETA[J]
   18 CONTINUE
C
      SSDCO = 0.0
C
      DO  20  I=1,LC
      SDCO[I] = CORECD[I]
      DO  19  J=3,JL
      SUCO[J,I] = THETA[J]*SUODCA[J,I]*SDCO[I]
   19 CONTINUE
      SUCO[2,I] = (U[2]/D)*SDCO[I]
      SSDCO = SSDCO + SDCO[I]
   20 CONTINUE
C
      DO  21  J=3,JL
      SSUCO[J] = 0.0
      DO  21  I=1,LC
      SSUCO[J] = SSUCO[J] + SUCO[J,I]
   21 CONTINUE
C
      GE[2] = 0.0
      GE[1] = SSDCO - D
C
      DO  22  J=3,JL
      GE[J] = SSJCO[J] - U[J]
   22 CONTINUE
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE    THET
      COMMON     TFO,LFO,VFO,XFO[4],YFO[4],ZO[9,4]
      COMMON    DGE[09,09],DGC[06,06],H[11,09],HF[6],AK[4,4],AV[4,4]
      COMMON    AL[4,4]
      COMMON    SVO[09,4],SV[09,4],AO[09,4],A[09,4],SUO[09,4],SUCO[09,4]
      COMMON    Z[09,4],SLO[09,4],SL[09,4],P[09,4],RO[09,4],ISUCO[09,4]
      COMMON    XO[09,4],X[09,4],YO[09,4],Y[09,4],SLODCA[09,4]
      COMMON    SVODCA[09,4],SUODCA[09,4],KAY[09,4]
      COMMON    TO[09],T[09],LO[09],L[09],VO[09],V[09],JO[09],U[09],F[09]
      COMMON    G[09],TAUO[09],TAU[09],THETA[09],SSUCO[09],GE[09],IGE[09]
      COMMON    DELTH[09],ISSUCO[09],DTHETA[09],KR[09]
      COMMON    CXFO[4],CXF[4],XF[4],YF[4],SDO[4],SDCO[4],SBO[4],SBCA[4]
      COMMON    SDCA[4],SBODCA[4],SSU[4],SSUTHD[4],ISDCO[4]
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPRI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERRUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      DO  30  K=1,JL
      DELTH[K] = 0.5E-02*THETA[K]
      IF (K-2)  23,30,23
   23 CONTINUE
      THETA[K] = THETA[K] + DELTH[K]
C
      ISSDCO = 0.0
C
      DO  25  I=1,LC
      SSUTHD[I] = SSUTHD[I] + DELTH[K]*SUODCA[K,I]
      ISDCO[I] = CORECO[I]
      DO  24  J=3,JL
      ISUCO[J,I] = THETA[J]*SUODCA[J,I]*ISDCO[I]
   24 CONTINUE
      ISUCO[2,I] = SUCO[2,I]
      ISSDCO = ISSDCO + ISDCO[I]
   25 CONTINUE
C
      DO  26  J=3,JL
      ISSUCO[J] = 0.0
      DO  26  I=1,LC
      ISSUCO[J] = ISSUCO[J] + ISUCO[J,I]
   26 CONTINUE
C
      IGE[2] = 0.0
      IGE[1] = ISSDCO - D
C
      DO  27  J=3,JL
      IGE[J] = ISSUCO[J] - U[J]
   27 CONTINUE
C
      DO  29  J=1,JL
      IF (J-2)  28,29,28
   28 DGE[J,K] = (IGE[J] - GE[J]) / DELTH[K]
   29 CONTINUE
C
      THETA[K] = THETA[K] - DELTH[K]
C
      DO  30  I=1,LC
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17

```
      SSUTHD(I) = SSUTHD(I) - DELTH(K)*SUODCA(K,J)
   30 CONTINUE
      DO  301  J=1,JL
      DGE(2,J) = 0.0
      DGE(J,2) = 0.0
  301 CONTINUE
C
      RETURN
      END
```

```
$OVERLAY      A
$FORTRAN
      SUBROUTINE TIGHT
      COMMON     TFO,LFO,VFO,XFO[4],YFO[4],ZO[9,4]
      COMMON    DGE[09,09],DGC[06,06],H[11,09],HF[6],AK[4,4],AV[4,4]
      COMMON    AL[4,4]
      COMMON    SVO[09,4],SV[09,4],AO[09,4],A[09,4],SUO[09,4],SUCO[09,4]
      COMMON    Z[09,4],SLO[09,4],SL[09,4],P[09,4],RO[09,4],ISUCO[09,4]
      COMMON    XO[09,4],X[09,4],YO[09,4],Y[09,4],SLODCA[09,4]
      COMMON    SVODCA[09,4],SUODCA[09,4],KAY[09,4]
      COMMON    TO[09],T[09],LO[09],L[09],VO[09],V[09],UO[09],U[09],F[09]
      COMMON    G[09],TAUO[09],TAU[09],THETA[09],SSUCO[09],GE[09],IGE[09]
      COMMON    DELTH[09],ISSUCO[09],DTHETA[09],KB[09]
      COMMON    CXFO[4],CXF[4],XF[4],YF[4],SUO[4],SUCO[4],SBO[4],SBCA[4]
      COMMON    SDCA[4],SBODCA[4],SSU[4],SSUTHO[4],ISDCO[4]
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERSUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      JMAX = 6
      JMIN = JL-1
      DO  307  J=1,JMAX
      DO  307  I=1,JMAX
      DGC[I,J] = 0.0
  307 CONTINUE
C
      DO  306  J=1,JL
      IF (J-2)  301,303,302
  301 DGC[1,J] = DGE[1,J]
      GO TO 303
  302 DGC[1,J-1] = DGE[1,J]
  303 CONTINUE
      DO  306  K=3,JL
      IF (J-2)  304,306,305
  304 DGC[K-1,J] = DGE[K,J]
      GO TO 306
  305 DGC[K-1,J-1] = DGE[K,J]
  306 CONTINUE
C
      K = JMIN
      DO  308  J=2,JMIN
      DO  308  I=1,JMIN
      K = K+1
      JN = (K-1)/JMAX + 1
      IN = K - (JN-1)*JMAX
      DGC[IN,JN] = DGC[I,J]
  308 CONTINUE
      IN = IN+1
      DO  309  J=JN,JMAX
      DO  309  I=IN,JMAX
      DGC[I,J] = 0.0
  309 CONTINUE
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE MINV(A,N,D,L,M)                                        MIN0036
      DIMENSION A(1),L(1),M(1)                                          MIN0037
C                                                                       MIN0038
C     .................................................................MIN0039
C                                                                       MIN0040
C        SUBROUTINE MINV                                                MIN0041
C                                                                       MIN0042
C        PURPOSE                                                        MIN0043
C           INVERT A MATRIX                                             MIN0044
C                                                                       MIN0045
C        USAGE                                                          MIN0046
C           CALL MINV(A,N,D,L,M)                                        MIN0047
C                                                                       MIN0048
C        DESCRIPTION OF PARAMETERS                                      MIN0049
C           A - INPUT MATRIX, DESTROYED IN COMPUTATION AND REPLACED BY  MIN0050
C               RESULTANT INVERSE.                                      MIN0051
C           N - ORDER OF MATRIX A                                       MIN0052
C           D - RESULTANT DETERMINANT                                   MIN0053
C           L - WORK VECTOR OF LENGTH N                                 MIN0054
C           M - WORK VECTOR OF LENGTH N                                 MIN0055
C                                                                       MIN0056
C        REMARKS                                                        MIN0057
C           MATRIX A MUST BE A GENERAL MATRIX                           MIN0058
C                                                                       MIN0059
C        SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED                  MIN0060
C           NONE                                                        MIN0061
C                                                                       MIN0062
C        METHOD                                                         MIN0063
C           THE STANDARD GAUSS-JORDAN METHOD IS USED. THE DETERMINANT   MIN0064
C           IS ALSO CALCULATED. A DETERMINANT OF ZERO INDICATES THAT    MIN0065
C           THE MATRIX IS SINGULAR.                                     MIN0066
C                                                                       MIN0067
C     .................................................................MIN0068
C                                                                       MIN0069
C                                                                       MIN0070
C     .................................................................MIN0071
C                                                                       MIN0072
C        IF A DOUBLE PRECISION VERSION OF THIS ROUTINE IS DESIRED, THE  MIN0073
C        C IN COLUMN 1 SHOULD BE REMOVED FROM THE DOUBLE PRECISION      MIN0074
C        STATEMENT WHICH FOLLOWS.                                       MIN0075
C                                                                       MIN0076
C     DOUBLE PRECISION A,D,BIGA,HOLD                                    MIN0077
C                                                                       MIN0078
C        THE C MUST ALSO BE REMOVED FROM DOUBLE PRECISION STATEMENTS    MIN0079
C        APPEARING IN OTHER ROUTINES USED IN CONJUNCTION WITH THIS      MIN0080
C        ROUTINE.                                                       MIN0081
C                                                                       MIN0082
C        THE DOUBLE PRECISION VERSION OF THIS SUBROUTINE MUST ALSO      MIN0083
C        THE DOUBLE PRECISION VERSION OF THIS SUBROUTINE MUST ALSO      MIN0084
C        CONTAIN DOUBLE PRECISION FORTRAN FUNCTIONS.  ABS IN STATEMENT  MIN0085
C        10 MUST BE CHANGED TO DABS.                                    MIN0086
C                                                                       MIN0087
C     .................................................................MIN0088
C                                                                       MIN0089
C        SEARCH FOR LARGEST ELEMENT                                     MIN0090
C                                                                       MIN0091
      D=1.0                                                             MIN0092
```

```
      NK=-N                                                          MIN0061
      DO 80 K=1,N                                                    MIN0062
      NK=NK+N                                                        MIN0063
      L(K)=K                                                         MIN0064
      M(K)=K                                                         MIN0065
      KK=NK+K                                                        MIN0066
      BIGA=A(KK)                                                     MIN0067
      DO 20 J=K,N                                                    MIN0068
      IZ=N*(J-1)                                                     MIN0069
      DO 20 I=K,N                                                    MIN0070
      IJ=IZ+I                                                        MIN0071
   10 IF( ABS(BIGA)- ABS(A(IJ))) 15,20,20                            MIN0072
   15 BIGA=A(IJ)                                                     MIN0073
      L(K)=I                                                         MIN0074
      M(K)=J                                                         MIN0075
   20 CONTINUE                                                       MIN0076
C                                                                    MIN0077
C        INTERCHANGE ROWS                                            MIN0078
C                                                                    MIN0079
      J=L(K)                                                         MIN0080
      IF(J-K) 35,35,25                                               MIN0081
   25 KI=K-N                                                         MIN0082
      DO 30 I=1,N                                                    MIN0083
      KI=KI+N                                                        MIN0084
      HOLD=-A(KI)                                                    MIN0085
      JI=KI-K+J                                                      MIN0086
      A(KI)=A(JI)                                                    MIN0087
   30 A(JI) =HOLD                                                    MIN0088
C                                                                    MIN0089
C        INTERCHANGE COLUMNS                                         MIN0090
C                                                                    MIN0091
   35 I=M(K)                                                         MIN0092
      IF(I-K) 45,45,38                                               MIN0093
   38 JP=N*(I-1)                                                     MIN0094
      DO 40 J=1,N                                                    MIN0095
      JK=NK+J                                                        MIN0096
      JI=JP+J                                                        MIN0097
      HOLD=-A(JK)                                                    MIN0098
      A(JK)=A(JI)                                                    MIN0099
   40 A(JI) =HOLD                                                    MIN0100
C                                                                    MIN0101
C        DIVIDE COLUMN BY MINUS PIVOT (VALUE OF PIVOT ELEMENT IS     MIN0102
C        CONTAINED IN BIGA)                                          MIN0103
C                                                                    MIN0104
   45 IF(BIGA) 48,46,48                                              MIN0105
   46 D=0.0                                                          MIN0106
      RETURN                                                         MIN0107
   48 DO 55 I=1,N                                                    MIN0108
      IF(I-K) 50,55,50                                               MIN0109
   50 IK=NK+I                                                        MIN0110
      A(IK)=A(IK)/(-BIGA)                                            MIN0111
   55 CONTINUE                                                       MIN0112
C                                                                    MIN0113
C        REDUCE MATRIX                                               MIN0114
C                                                                    MIN0115
      DO 65 I=1,N                                                    MIN0116
      IK=NK+I                                                        MIN0117
      IJ=I-N                                                         MIN0118
      DO 65 J=1,N                                                    MIN0119
      IJ=IJ+N                                                        MIN0120
```

```
      IF(I-K) 60,65,60                                                  MIN0122
   60 IF(J-K) 62,65,62                                                  MIN0123
   62 KJ=IJ-I+K                                                         MIN0124
      A(IJ)=A(IK)*A(KJ)+A(IJ)                                           MIN0125
   65 CONTINUE                                                          MIN0126
C                                                                       MIN0127
C        DIVIDE ROW BY PIVOT                                            MIN0128
C                                                                       MIN0129
      KJ=K-N                                                            MIN0130
      DO 75 J=1,N                                                       MIN0131
      KJ=KJ+N                                                           MIN0132
      IF(J-K) 70,75,70                                                  MIN0133
   70 A(KJ)=A(KJ)/BIGA                                                  MIN0134
   75 CONTINUE                                                          MIN0135
C                                                                       MIN0136
C        PRODUCT OF PIVOTS                                              MIN0137
C                                                                       MIN0138
      D=D*BIGA                                                          MIN0139
C                                                                       MIN0140
C        REPLACE PIVOT BY RECIPROCAL                                    MIN0141
C                                                                       MIN0142
      A(KK)=1.0/BIGA                                                    MIN0143
   80 CONTINUE                                                          MIN0144
C                                                                       MIN0145
C        FINAL ROW AND COLUMN INTERCHANGE                               MIN0146
C                                                                       MIN0147
      K=N                                                               MIN0148
  100 K=(K-1)                                                           MIN0149
      IF(K) 150,150,105                                                 MIN0150
  105 I=L(K)                                                            MIN0151
      IF(I-K) 120,120,108                                               MIN0152
  108 JQ=N*(K-1)                                                        MIN0153
      JR=N*(I-1)                                                        MIN0154
      DO 110 J=1,N                                                      MIN0155
      JK=JQ+J                                                           MIN0156
      HOLD=A(JK)                                                        MIN0157
      JI=JR+J                                                           MIN0158
      A(JK)=-A(JI)                                                      MIN0159
  110 A(JI) =HOLD                                                       MIN0160
  120 J=M(K)                                                            MIN0161
      IF(J-K) 100,100,125                                               MIN0162
  125 KI=K-N                                                            MIN0163
      DO 130 I=1,N                                                      MIN0164
      KI=KI+N                                                           MIN0165
      HOLD=A(KI)                                                        MIN0166
      JI=KI-K+J                                                         MIN0167
      A(KI)=-A(JI)                                                      MIN0168
  130 A(JI) =HOLD                                                       MIN0169
      GO TO 100                                                         MIN0170
  150 RETURN                                                            MIN0171
      END                                                               MIN0172
```



```
$OVERLAY     A
$FORTRAN
      SUBROUTINE LOOSE
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),JO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTBD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      JMAX = 6
      JMIN = JL-1
      K = JMIN*JMIN+1
      DO  320  N=1,JMAX
      DO  320  M=1,JMAX
      J = JMAX-N+1
      I = JMAX-M+1
      IF (J-JMIN) 317,317,319
  317 IF (I-JMIN) 318,318,319
  318 CONTINUE
      K = K-1
      JO = (K-1)/JMAX + 1
      IO = K - (JO-1)*JMAX
      DGC(I,J) = DGC(IO,JO)
      GO TO 320
  319 CONTINUE
      DGC(I,J) = 0.0
  320 CONTINUE
C
      DO  316  J=1,JL
      IF (J-2)  311,313,312
  311 DGE(1,J) = DGC(1,J)
      GO TO 313
  312 DGE(1,J) = DGC(1,J-1)
  313 CONTINUE
C
      DO  316  K=3,JL
      IF (J-2)  314,316,315
  314 DGE(K,J) = DGC(K-1,J)
      GO TO 316
  315 DGE(K,J) = DGC(K-1,J-1)
  316 CONTINUE
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   THETAF
      COMMON     TFO,LFO,VFO,XFO[4],YFO[4],ZO[9,4]
      COMMON    DGE[09,09],DGC[06,06],H[11,09],FF[6],AK[4,4],AV[4,4]
      COMMON    AL[4,4]
      COMMON    SVO[09,4],SV[09,4],AO[09,4],A[09,4],SUO[09,4],SUCO[09,4]
      COMMON    Z[09,4],SLO[09,4],SL[09,4],P[09,4],RO[09,4],ISUCO[09,4]
      COMMON    XO[09,4],X[09,4],YO[09,4],Y[09,4],SLODCA[09,4]
      COMMON    SVODCA[09,4],SUODCA[09,4],KAY[09,4]
      COMMON    TO[09],T[09],LO[09],L[09],VO[09],V[09],JO[09],U[09],F[09]
      COMMON    G[09],TAUO[09],TAU[09],THETA[09],SSUCO[09],GE[09],IGE[09]
      COMMON    DELTH[09],ISSUCO[09],DTHETA[09],KB[09]
      COMMON    CXFO[4],CXF[4],XF[4],YF[4],SDO[4],SDCO[4],SBO[4],SBCA[4]
      COMMON    SDCA[4],SBODCA[4],SSU[4],SSUTHD[4],ISDCO[4]
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERROR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL      LFO
      DO  34  J=1,JL
      DTHETA[J] = 0.0
      IF (J-2) 31,34,31
   31 DO  33  K=1,JL
      IF (K-2) 32,33,32
   32 DTHETA[J] = DTHETA[J] - GE[K]*DGE[J,K]
   33 CONTINUE
   34 CONTINUE
C
      DO  351  J=1,JL
      THETA[J] = THETA[J] + DTHETA[J]
      IF (THETA[J]) 350,351,351
  350 THETA[J] = (THETA[J] - DTHETA[J])/2.0
  351 CONTINUE
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   TEMPRO
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,05),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERRHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERRUB
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL      LFO
      DO  36  I=1,LC
      SDCO(I) = CORECD(I)
      SUCO(2,I) = U(2) *SDCO(I) / D
      SUCO(JR,I) = THETA(1) * (U(JR)/L(JR)) * SBODCA(I) * SDCO(I)
      DO  35  J=3,JL
      SUCO(J,I) = SUODCA(J,I) * SDCO(I) * THETA(J)
   35 CONTINUE
   36 CONTINUE
C
      DO  360  J=2,JR
      SSUCO(J) = 0.0
      DO  360  I=1,LC
      SSUCO(J) = SSUCO(J) + SUCO(J,I)
  360 CONTINUE
C
      DO  38  J=2,JR
C     KAY(J,IREF) = EQUILK(AK,IREF,T(J))
      KB(J) = 0.0
      DO  37  I=1,LC
      X(J,I) = SUCO(J,I) / SSUCO(J)
C     KAY(J,I) = EQUILK(AK,I,T(J))
C     KB(J) = KB(J) + EFF(J,T)*(KAY(J,I)/KAY(J,IREF))*X(J,I)
      KB(J) = KB(J) + AK(1,I)*X(J,I)
   37 CONTINUE
      KB(J) = 1.0 / KB(J)
C     T(J) = TCONB / (ALOG(KB(J))-TCONA)
   38 CONTINUE
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   PREDIC(KIT)
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DCE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),JO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERROR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      ITER = ITER + 1
      KIT = ITER
C
      DO  60  J=1,JL
      IF (ABS(THETA(J)-1.0)-ERPHI)  60,60,62
   60 CONTINUE
C
      IDIR = 1
      IF (TIME-HITIME)  63,63,61
C
   61 IDIR = -1
      RETURN
C
   62 IDIR = 0
      RETURN
C
   63 CONTINUE
      KTIM = KTIM + 1
C
      DELTO = DELT
      IF (KTIM-10) 65,65,64
   64 DELT = DELT * 2.0
      KTIM = 1
   65 CONTINUE
      RETURN
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE    RITE1
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),JO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERRUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
  274 FORMAT    (12H1PROBLEM NO.,/,17HOITERATION NO. = ,I3,/,
     1  8HOTIME = ,F10.3,//,                                    53HOLIQUID M
     2OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)
      WRITE     (NIW,274)    ITER,TIME
  276 FORMAT    (21HO       BOTTOM PRODUCT,/,(5E20.8))
      WRITE     (NIW,276)    (X(JR,I),I=1,LC)
  277 FORMAT    (19HO       PLATE NO. = ,I3,/,(5E20.8))
      DO  71   K=3,JL
      JPLATE = K-2
      J = JL-K+3
      WRITE     (NIW,277)    JPLATE,(X(J,I),I=1,LC)
   71 CONTINUE
  279 FORMAT    (13HO       REFLUX, /,(5E20.8))
      WRITE     (NIW,279)    (X(2,I),I=1,LC)
  280 FORMAT    (18HO       TOP PRODUCT,/,(5E20.8))
      WRITE     (NIW,280)    (X(2,I),I=1,LC)
  281 FORMAT    (34HOBOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))
      WRITE     (NIW,281)    (L(JR)*X(JR,I)/(CXF(I)*FEED),I=1,LC)
  282 FORMAT    (31HOTOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))
      WRITE     (NIW,282)    (L(2)*X(2,I)/(CXF(I)*FEED),I=1,LC)
  292 FORMAT    (42HOSUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEA
     1DY STATE    ,/,(5E20.8),/)
      WRITE     (NIW,292)    ((L(JR)*X(JR,I)+L(2)*X(2,I))/(CXF(I)*FEED),I=1
     1                        ,LC)
  283 FORMAT    (27HOMOLES OF FEED AND PRODUCTS)
      WRITE     (NIW,283)
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   RITE2
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON    AL(4,4)
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHO(4),ISDCO(4)
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERRUP
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL      LFO
  284 FORMAT    (70H0      COMPONENT           FEED          BOTTOM PRODUCT
     1       TOP PRODUCT,/,(I11,E22.8,2E19.8))
      WRITE     (NIW,284) (I,CXF(I)*FEED,X(JR,I)*L(JR),X(2,I)*L(2),I=1,LC)
  285 FORMAT    (2H  ,/,E33.8,2E19.8)
      WRITE     (NIW,285)   FEED,L(JR),L(2)
      DO  72  J=2,JR
      H(11,J) = 0.0
      DO  72  I=1,LC
      H(11,J) = H(11,J) + X(J,I)
   72 CONTINUE
  286 FORMAT    (16H0PLATE VARIABLES)
      WRITE     (NIW,286)
  287 FORMAT    (115H0      SUMMATIONS          TEMPERATURES        VAPOR F
     1LOWS          LIQUID FLOWS     VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,
     2 (6E19.8))
      WRITE     (NIW,287)   (H(11,J),T(J),V(J),L(J), 0.0,0.0,     J=2,JR)
C     WRITE     (NIW,287)   (H(11,J),T(J),V(J),L(J),H(6,J),H(7,J),J=2,JR)
C     RDUTY = CDUTY + L(JR)*H(7,JR) + D*H(6,2) - HF(5)
  288 FORMAT    (18H0CONDENSER LOAD = ,E15.8,/,17H0REBOILER LOAD = ,E15.8
     1,/,7H0PHI = ,E15.8)
C     WRITE     (NIW,288)  CDUTY,RDUTY,THETA(JF)
  289 FORMAT    (6H0THETA, 9F12.7)
      WRITE     (NIW,289)   (THETA(J),J=1,JT)
      K = JL-1
  290 FORMAT (6H0DGC  ,2X,1P6E18.8,/)
      DO  73  J=1,K
      WRITE     (NIW,290)   (DGC(J,I),I=1,K)
   73 CONTINUE
C
      RETURN
      END
```

```
$OVERLAY     A
$FORTRAN
      SUBROUTINE   NEWTIM
      COMMON     TFO,LFO,VFO,XFO[4],YFO[4],ZO[9,4]
      COMMON    DGE[09,09],DGC[06,06],H[11,09],HF[6],AK[4,4],AV[4,4]
      COMMON    AL[4,4]
      COMMON    SVO[09,4],SV[09,4],AO[09,4],A[09,4],SUO[09,4],SUCO[09,4]
      COMMON    Z[09,4],SLO[09,4],SL[09,4],P[09,4],RO[09,4],ISUCO[09,4]
      COMMON    XO[09,4],X[09,4],YO[09,4],Y[09,4],SLODCA[09,4]
      COMMON    SVODCA[09,4],SUODCA[09,4],KAY[09,4]
      COMMON    TO[09],T[09],LO[09],L[09],VO[09],V[09],UO[09],U[09],F[09]
      COMMON    G[09],TAUO[09],TAU[09],THETA[09],SSUCO[09],GE[09],IGE[09]
      COMMON    DELTH[09],ISSUCO[09],DTHETA[09],KB[09]
      COMMON    CXFO[4],CXF[4],XF[4],YF[4],SUO[4],SUCO[4],SBO[4],SBCA[4]
      COMMON    SDCA[4],SBODCA[4],SSU[4],SSUTHD[4],ISDCO[4]
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUR
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIN,IREF,KTIM,ITER,IDIR,IS5
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      GO TO 2222
      DO  70  J=2,JR
      TN = T[J] + (T[J] - TO[J])/DELTO * DELT
      TO[J] = T[J]
      T[J] = TN
C
      VN = V[J] + (V[J] - VO[J])/DELTO * DELT
      VO[J] = V[J]
      V[J] = VN
C
      IF (J-JF+1)  66,67,68
   66 Z1 = 0.0
      GO TO 69
   67 Z1 = VF
      GO TO 69
   68 Z1 = FEED
   69 CONTINUE
C
      LN = V[J+1]+Z1-D + SIG*(VO[J+1] + Z1-LO[J]-D)
      LO[J] = L[J]
      L[J] = LN
C
   70 CONTINUE
 2222 CONTINUE
C
      VO[2] = D
      V[2] = D
      L[2] = LZ
      LO[2] = LZ
      TIME=TIME + DELT
      DO  77  J=2,JR
      DO  76  I=1,LC
      XO[J,I] = X[J,I]
      YO[J,I] = EQUILK(AK,I,KB[J])*X[J,I]
C     YO[J,I] = EQUILK(AK,I,TO[J])* X[J,I]
      SVO[J,I] = VO[J] * YO[J,I]
      SUO[J,I] = SUCO[J,I]
      ZO[J,I] = Z[J,I]
   76 CONTINUE
```

```
      TAUO(J) = TAU(J)
      UO(J) = U(J)
   77 CONTINUE
C
      DO  78  I=1,LC
      SBO(I) = L(JR)*X(JR,I)
      SDO(I) = D * X(2,I)
      CXFO(I) = CXF(I)
   78 CONTINUE
C
      DO  79  I=1,LC
      YO(2,I) = XO(2,I)
      SVO(2,I) = XO(2,I) * D
   79 CONTINUE
      RETURN
      END
```

```
$DATA
   ROUTINE   RELOC ENTRY   ROUTINE   RELOC ENTRY   ROUTINE   RELOC ENTRY   ROU
     NAME    FACTOR POINT    NAME    FACTOR POINT    NAME    FACTOR POINT     N.
     ,KP     06000 06000     OVRLAY  06612 06612     EQUILK  07030 07030
     EFF     10042 10042
     DATAD   10112 10112
 OVERLAY  A     , NUMBER  01, STARTS  10112, LENGTH  01207, LOWEST COMMON 32732
     DOUT1   10112 10112
 OVERLAY  A     , NUMBER  02, STARTS  10112, LENGTH  00730, LOWEST COMMON 32732
     DOUT2   10112 10112
 OVERLAY  A     , NUMBER  03, STARTS  10112, LENGTH  01017, LOWEST COMMON 32732
     ONCE    10112 10112
 OVERLAY  A     , NUMBER  04, STARTS  10112, LENGTH  01326, LOWEST COMMON 32732
     BEGINT  10112 10112
 OVERLAY  A     , NUMBER  05, STARTS  10112, LENGTH  00744, LOWEST COMMON 32732
     THETAT  10112 10112
 OVERLAY  A     , NUMBER  06, STARTS  10112, LENGTH  00575, LOWEST COMMON 32732
     DORAT   10112 10112
 OVERLAY  A     , NUMBER  07, STARTS  10112, LENGTH  01253, LOWEST COMMON 32732
     CORDEE  10112 10112
 OVERLAY  A     , NUMBER  08, STARTS  10112, LENGTH  01012, LOWEST COMMON 32732
     THET    10112 10112
 OVERLAY  A     , NUMBER  09, STARTS  10112, LENGTH  01147, LOWEST COMMON 32732
     TIGHT   10112 10112
 OVERLAY  A     , NUMBER  10, STARTS  10112, LENGTH  00701, LOWEST COMMON 32732
     MINV    10112 10112
 OVERLAY  A     , NUMBER  11, STARTS  10112, LENGTH  01163, LOWEST COMMON 32732
     LOOSE   10112 10112
 OVERLAY  A     , NUMBER  12, STARTS  10112, LENGTH  00552, LOWEST COMMON 32732
     THETAF  10112 10112
 OVERLAY  A     , NUMBER  13, STARTS  10112, LENGTH  00525, LOWEST COMMON 32732
     TEMPRO  10112 10112
 OVERLAY  A     , NUMBER  14, STARTS  10112, LENGTH  00766, LOWEST COMMON 32732
     PREDIC  10112 10112
 OVERLAY  A     , NUMBER  15, STARTS  10112, LENGTH  00437, LOWEST COMMON 32732
     RITE1   10112 10112
 OVERLAY  A     , NUMBER  16, STARTS  10112, LENGTH  01262, LOWEST COMMON 32732
     RITE2   10112 10112
 OVERLAY  A     , NUMBER  17, STARTS  10112, LENGTH  01150, LOWEST COMMON 32732
     NEWTIM  10112 10112
 OVERLAY  A     , NUMBER  18, STARTS  10112, LENGTH  01303, LOWEST COMMON 32732
LIBRARY ROUTINES USED
     ABS     11442 11452     ,RI     11466 11466     ,WO     11466 11536
   FIRST LOCATION  NOT USED 11623, LOWEST COMMON 32732
```

BD - Diagrama de Bloco para o Simulador Leans, elaborado para o Exemplo III.2.A

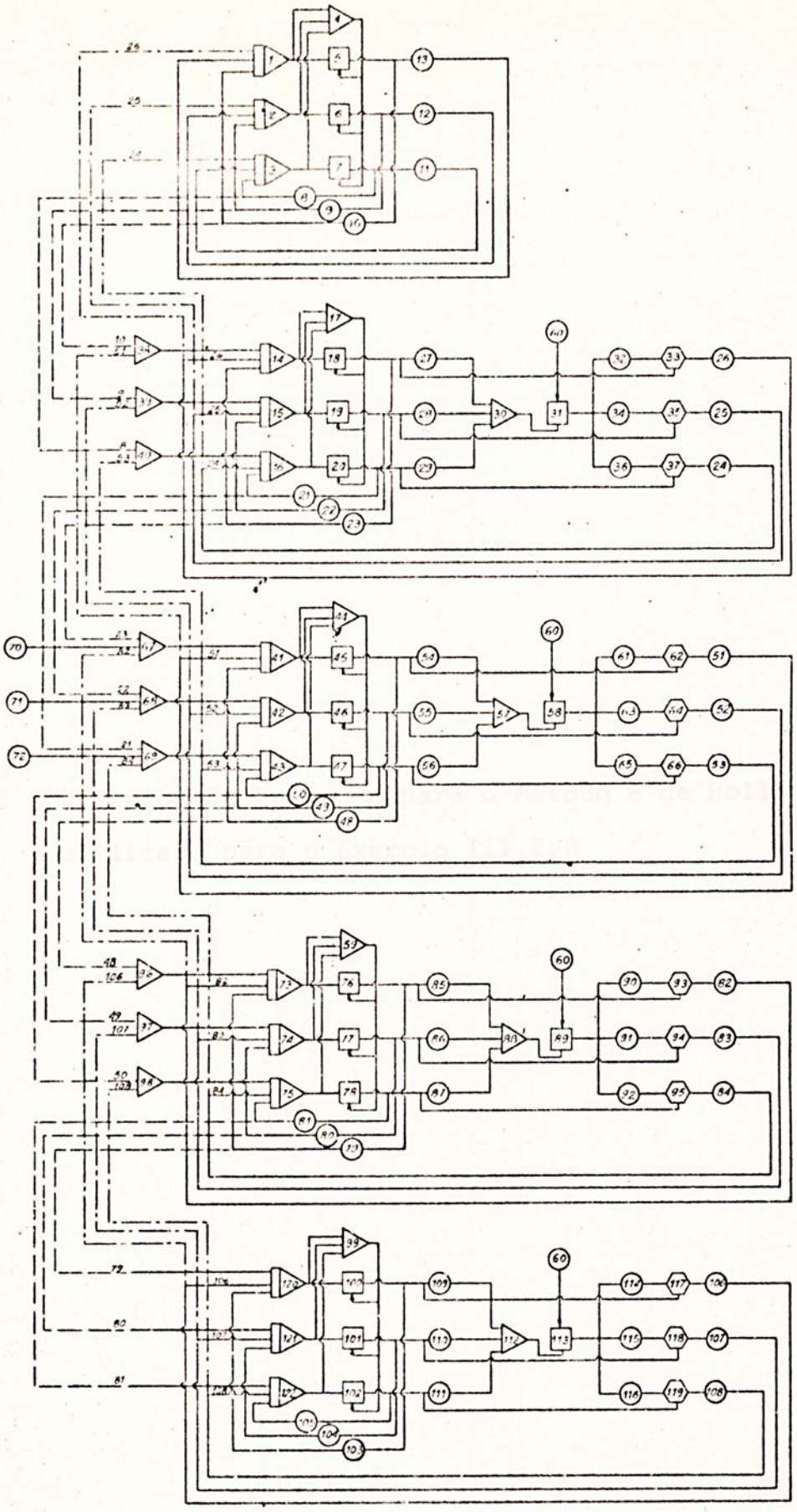


Diagrama de Blocos do Simulador Analógico Leans para o Exemplo III.2.A , $\Delta t = 0{,}2$ min.

BE - Listagem do Programa para o Método θ de Holland, utilizado para o Exemplo III.2.B

Formato A-4 - 210x297 mm

```
      PROGRAM  HOLLAN (INPUT,OUTPUT,TAPE10=INPUT,TAPE5=OUTPUT)                  A 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                               A 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)             A 0020
      COMMON   AL(4,4)                                                          A 0030
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)         A 0040
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)          A 0050
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)                   A 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)                              A 0070
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)        A 0080
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)        A 0090
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                           A 0100
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)         A 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)                      A 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI             A 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERBUB                                   A 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5                A 0150
      REAL      LFO                                                             A 0160
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO           A 0170
      DIMENSION   LJUNK(6),MJUNK(6)                                             A 0180
      DIMENSION   NOV(30)                                                       A 0190
      DATA     NOV/01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18        A 0200
     1,            15,16,17,18,23,24,25,26,27,28,29,30/                        A 0210
C     DATA     NOV/01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18        A 0220
C    1,            19,20,21,22,23,24,25,26,27,28,29,30/                        A 0230
      NTC = 10                                                                  A 0240
      NTW = 5                                                                   A 0250
C                                                                               A 0260
C     MAIN LINE                                                                 A 0270
C                                                                               A 0280
C                                                                               A 0290
C     OVERLAY DIRECTORY                                                         A 0300
C                                                                               A 0310
C          SUBSCRIPT (K) OF NOV INDICATES THE SUBROUTINE NAME                   A 0320
C                                                                               A 0330
C          THE VALUE OF NOV(K) INDICATES THE PHYSICAL ORDER OF                  A 0340
C           APPEARANCE IN THE DECK                                              A 0350
C                                                                               A 0360
C               NOV(01) = DATAD                                                 A 0370
C               NOV(02) = DOUT1                                                 A 0380
C               NOV(03) = DOUT2                                                 A 0390
C               NOV(04) = ONCE                                                  A 0400
C               NOV(05) = BEGINT                                                A 0410
C               NOV(06) = THETAT                                                A 0420
C               NOV(07) = DORAT                                                 A 0430
C               NOV(08) = CORDEE                                                A 0440
C               NOV(09) = THET                                                  A 0450
C               NOV(10) = TIGHT                                                 A 0460
C               NOV(11) = MINV                                                  A 0470
C               NOV(12) = LOOSE                                                 A 0480
C               NOV(13) = THETAF                                                A 0490
C               NOV(14) = TEMPRO                                                A 0500
C               NOV(15) = ENTHAL                                                A 0510
C               NOV(16) = ENTHA2                                                A 0520
C               NOV(17) = LCORR                                                 A 0530
C               NOV(18) = LCORR2                                                A 0540
C               NOV(19) = PREDIC                                                A 0550
C               NOV(20) = RITE1                                                 A 0560
C               NOV(21) = RITE2                                                 A 0570
C               NOV(22) = NEWTIM                                                A 0580
C                                                                               A 0590
C                                                                               A 0600
C                                                                               A 0610
```

```
C                                                                       A 0610
 1000 CONTINUE                                                          A 0620
      CALL OVRLAY(NOV(01))                                      B58     A 0630
      CALL DATAD (IS5)                                                  A 0640
      CALL OVRLAY(NOV(02))                                              A 0650
      CALL DOUT1                                                        A 0660
      CALL OVRLAY(NOV(03))                                              A 0670
      CALL DOUT2                                                        A 0680
      CALL OVRLAY(NOV(04))                                              A 0690
      CALL ONCE                                                         A 0700
 2000 CONTINUE                                                          A 0710
      CALL OVRLAY(NOV(05))                                              A 0720
      CALL BEGINT                                                       A 0730
 3000 CONTINUE                                                          A 0740
      CALL OVRLAY(NOV(06))                                              A 0750
      CALL THETAT                                                       A 0760
      CALL OVRLAY(NOV(07))                                              A 0770
      CALL DORAT                                                        A 0780
      CALL OVRLAY(NOV(08))                                              A 0790
      CALL CORDEE                                                       A 0800
      CALL OVRLAY(NOV(09))                                              A 0810
      CALL THET                                                         A 0820
      CALL OVRLAY(NOV(10))                                              A 0830
      CALL TIGHT                                                        A 0840
      CALL OVRLAY(NOV(11))                                              A 0850
      CALL MINV (DGC,JL-1,RES,MJUNK,LJUNK)                              A 0860
      CALL OVRLAY(NOV(12))                                              A 0870
      CALL LOOSE                                                        A 0880
      CALL OVRLAY(NOV(13))                                              A 0890
      CALL THETAE                                                       A 0900
      CALL OVRLAY(NOV(14))                                              A 0910
      CALL TEMPRO                                                       A 0920
      CALL OVRLAY(NOV(15))                                              A 0930
      CALL ENTHAL                                                       A 0940
      CALL OVRLAY(NOV(16))                                              A 0950
      CALL ENTHA2                                                       A 0960
      CALL OVRLAY(NOV(17))                                              A 0970
      CALL LCORR                                                        A 0980
      CALL OVRLAY(NOV(18))                                              A 0990
      CALL LCORR2                                                       A 1000
      CALL OVRLAY(NOV(19))                                              A 1010
      CALL PREDIC (ITER)                                                A 1020
C                                                                       A 1030
      IF (IS5)  3500,3500,3400                                          A 1040
 3400 CONTINUE                                                          A 1050
      CALL OVRLAY(NOV(20))                                              A 1060
      CALL RITE1                                                        A 1070
      CALL OVRLAY(NOV(21))                                              A 1080
      CALL RITE2                                                        A 1090
C                                                                       A 1100
 3500 CONTINUE                                                          A 1110
      IF (ITER-5)  3000,3000,4000                                       A 1120
 4000 CONTINUE                                                          A 1130
      IF (IDIR)  7000,5000,6000                                         A 1140
 5000 CONTINUE                                                          A 1150
      IF(ITER - 10) 3000,6000,6000                                      A 1160
C                                                                       A 1170
 6000 CONTINUE                                                          A 1180
      IF (IS5)  9000,9000,9500                                          A 1190
 9000 CONTINUE                                                          A 1200
      CALL OVRLAY (NOV(20))                                             A 1210
      CALL RITE1                                                        A 1220
      CALL OVRLAY (NOV(21))                                             A 1230
      CALL RITE2                                                        A 1240
 9500 CONTINUE                                                          A 1250
      CALL OVRLAY(NOV(22))                                              A 1260
      CALL NEWTIM                                                       A 1270
```

```
      CALL NEWTIM                                                        A 1270
      GO TO 2000                                                   B59   A 1280
C                                                                        A 1290
 7000 CONTINUE                                                           A 1300
      IF (IS5)  8000,8000,1000                                           A 1310
 8000 CONTINUE                                                           A 1320
      CALL OVRLAY(NOV(20))                                               A 1330
      CALL RITE1                                                         A 1340
      CALL OVRLAY(NOV(21))                                               A 1350
      CALL RITE2                                                         A 1360
      GO TO 1000                                                         A 1370
C                                                                        A 1380
      END                                                                A 1390
      SUBROUTINE  OVRLAY(I)                                              B 0000
      RETURN                                                             B 0010
      END                                                                B 0020
      FUNCTION   EQUILK(A,I,Q)                                           C 0000
      DIMENSION   A(4,4)                                                 C 0010
      T = Q+459.69                                                       C 0020
      Z = ((A(4,I)*T+A(3,I))*T+A(2,I))*T+A(1,I)                          C 0030
      EQUILK = Z*Z*Z*T                                                   C 0040
      RETURN                                                             C 0050
      END                                                                C 0060
C                                                                        C 0070
      FUNCTION   THALP(A,Q,I)                                            D 0000
      DIMENSION A(4,4)                                                   D 0010
      T = Q+459.69                                                       D 0020
      Z = (A(3,I)*T+A(2,I))*T+A(1,I)                                     D 0030
      THALP = Z*Z                                                        D 0040
      RETURN                                                             D 0050
      END                                                                D 0060
C                                                                        D 0070
      SUBROUTINE   BUBPT(X,J,TT,A,L,T,BPERR)                             E 0000
      DIMENSION   X(9,4),A(4,4)                                          E 0010
C                                                                        E 0020
C     SUBROUTINE FOR CALCULATING BUBBLE POINTS                           E 0030
C                                                                        E 0040
      NIW = 5                                                            E 0050
      KTIMES = 1                                                         E 0060
      IBP = -1                                                           E 0070
      T = TT                                                             E 0080
    3 SUMY = 0.0                                                         E 0090
      IBP = IBP + 1                                                      E 0100
      DO  4  I=1,L                                                       E 0110
      Y = EQUILK(A,I,T)*X(J,I)                                           E 0120
      SUMY = SUMY + Y                                                    E 0130
    4 CONTINUE                                                           E 0140
      IF (ABS(SUMY-1.0)-BPERR) 8,8,5                                     E 0150
    5 KTIMES = KTIMES - 1                                                E 0160
      IF (KTIMES) 7,6,6                                                  E 0170
    6 SUMYO = SUMY                                                       E 0180
      TO = T                                                             E 0190
      T = T + 10.0                                                       E 0200
      GO TO 3                                                            E 0210
    7 CONTINUE                                                           E 0220
      IF (T-TO)  10,11,10                                                E 0230
   10 CONTINUE                                                           E 0240
      SLOPE = (SUMY-SUMYO)/(T-TO)                                        E 0250
      IF (SLOPE)  12,11,12                                               E 0260
   12 CONTINUE                                                           E 0270
      TN = ((1.0-SUMY) / SLOPE) + T                                      E 0280
      SUMYO = SUMY                                                       E 0290
      TO = T                                                             E 0300
      T = TN                                                             E 0310
      GO TO 3                                                            E 0320
    8 CONTINUE                                                           E 0330
      WRITE  (NIW,10)  IBP                                               E 0340
```

```
      WRITE    (NIW,101)    ...                                          E 0340
  101 FORMAT    (110X,3HBP ,I4)                                          E 0350
      RETURN                                                    B60      E 0360
   11 CONTINUE                                                           E 0370
      ZILCH = 1.0-SUMY                                                   E 0380
      WRITE    (NIW,102)    SUMY,SUMYO,T,TO,SLOPE,ZILCH,BPERR,IBP       E 0390
  102 FORMAT    (1H0,30(1H*),//,43H WARNING. ZERO DENOMINATOR IN BUBBLE P E 0400
     1OINT   ,//,20H SUM OF Y          = , 0PE20.9,/,                   E 0410
     3  20H OLD SUM OF Y      = ,  E20.9,/,  20H TEMPERATURE (F)  = ,   E 0420
     6  E20.9,/,     20H OLD TEMP    (F)    = ,  E20.9,/,               E 0430
     7  20H SLOPE             = ,  E20.9,/,                            E 0440
     9  20H 1.0 - SUM OF Y    = ,  E20.9,/,                            E 0450
     1  20H ERROR LIMIT       = ,  E20.9,/,                            E 0460
     2  20H NO OF ITERATIONS = ,  I5,// 90(1H*),//)                     E 0470
      RETURN                                                           E 0480
      END                                                              E 0490
C                                                                      E 0500
      FUNCTION    CORECD(I)                                            F 0000
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                     F 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)   F 0020
      COMMON    AL(4,4)                                                F 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4) F 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4) F 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)         F 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)                    F 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) F 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09) F 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                 F 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4) F 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)            F 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HTTIME,TIME,ERPHI   F 0130
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                         F 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5      F 0150
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO F 0160
      REAL      LFO                                                    F 0170
      CORECD = (FEED*CXF(I) + SIG*(FEED*CXFO(I)-SDO(I)-SBO(I)) + SSU(I)/ F 0180
     1        FAC) / (1.0 + THETA(1)*SBODCA(I)*(1.0+U(JR)/FAC/L(JR)) +  F 0190
     2        SSUTHD(I)/FAC)                                           F 0200
C                                                                      F 0210
C                                                                      F 0220
      RETURN                                                           F 0230
      END                                                              F 0240
      SUBROUTINE EFF(J,T)                                              G 0000
      EFF = 1.0                                                        G 0010
C                                                                      G 0020
      RETURN                                                           G 0030
      END                                                              G 0040
      SUBROUTINE   DATAD(IO)                                           H 0000
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                     H 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)   H 0020
      COMMON    AL(4,4)                                                H 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4) H 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4) H 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)         H 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)                    H 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) H 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09) H 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                 H 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4) H 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)            H 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HTTIME,TIME,ERPHI   H 0130
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                         H 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5      H 0150
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO H 0160
      REAL      LFO                                                    H 0170
      READ     (NIC,201)    LC,NT,NF,IREF,IS5                         H 0180
      IO = ISE                                                         H 0190
```

```
      IC = 13
      READ     (NIC,202)    ((AK(K,I),K=1,4),I=1,LC)                          H 0200
      READ     (NIC,202)    ((AL(K,I),K=1,4),I=1,LC)                  B61     H 0210
      READ     (NIC,202)    ((AV(K,I),K=1,4),I=1,LC)                          H 0220
      JC = 2                                                                  H 0230
      JF = NF+2                                                               H 0240
      JL = NT+2                                                               H 0250
      JR = NT+3                                                               H 0260
      JT = NT+4                                                               H 0270
      READ     (NIC,202)    (TO(J),J=1,JT)                                    H 0280
      READ     (NIC,202)    (VO(J),J=1,JT)                                    H 0290
      READ     (NIC,202)    (LO(J),J=1,JT)                                    H 0300
      READ     (NIC,202)    (UO(J),J=1,JT)                                    H 0310
      READ     (NIC,202)    TFO,LFO,VFO                                       H 0320
      READ     (NIC,202)    TF, LF, VF                                        H 0330
      READ     (NIC,202)    D                                                 H 0340
      READ     (NIC,202)    MU, DELT, ERPHI, HITIME                           H 0350
      READ     (NIC,202)    TCONA, TCONB, CDUTYO, ERBUB                       H 0360
C                                                                             H 0370
      DO  1  J=1,JT                                                           H 0380
      READ     (NIC,203)    (XO(J,I),I=1,LC)                                  H 0390
      READ     (NIC,203)    (YO(J,I),I=1,LC)                                  H 0400
    1 CONTINUE                                                                H 0410
      READ     (NIC,203)    (XFO(I),I=1,LC)                                   H 0420
      READ     (NIC,203)    (YFO(I),I=1,LC)                                   H 0430
      READ     (NIC,203)    (XF(I),I=1,LC)                                    H 0440
      READ     (NIC,203)    (YF(I),I=1,LC)                                    H 0450
C                                                                             H 0460
C     READ     (NIC,203)    (KB(J),J=1,JT)                                    H 0470
C                                                                             H 0480
  201 FORMAT    (10I5)                                                        H 0490
  202 FORMAT    (4E20.8)                                                      H 0500
  203 FORMAT    (8E10.0)                                                      H 0510
C                                                                             H 0520
      RETURN                                                                  H 0530
      END                                                                     H 0540
C                                                                             H 0550
      SUBROUTINE   DOUT1                                                      I 0000
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                            I 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)          I 0020
      COMMON    AL(4,4)                                                       I 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)      I 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)       I 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)                I 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAV(09,4)                           I 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)     I 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)     I 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                        I 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)      I 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)                   I 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI          I 0130
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                                I 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5             I 0150
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO        I 0160
      REAL       LFO                                                          I 0170
      DO   626   I=1,LC                                                       I 0180
      X(1,I) = XF(I)                                                          I 0190
      X(9,I) = XFO(I)                                                         I 0200
  626 CONTINUE                                                                I 0210
      CALL BURPT (X,1,TO(JF),AK,LC,TF,ERBUB)                                  I 0220
      CALL BURPT(X,9,TO(JF),AK,LC,TFO,ERBUB)                                  I 0230
      DO  627  J=3,JR                                                         I 0240
      DO  627  I=1,LC                                                         I 0250
      YO(J,I) = EQUILK(AK,I,TO(J))*XO(J,I)                                    I 0260
  627 CONTINUE                                                                I 0270
      DO  628  I=1,LC                                                         I 0280
      YO(2,I) = YO(2,I)                                                       I 0290
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      1(XE(XX) = XO(XX)                                                  I 0290
  628 CONTINUE                                                           B62   I 0300
  205 FORMAT  (57H1INPUT DATA     DYNAMIC DISTILLATION     HOLLANDS METH  I 0310
     1OD )                                                               I 0320
      WRITE   (NIW,205)                                                  I 0330
  206 FORMAT   (86H0NO. OF COMPONENTS     STRIPPING PLATES     RECTIFYING  I 0340
     1 PLATES     REFERENCE COMPONENT  ,/,(I10,I22,I21,I22))             I 0350
      MEOW = JL - JF                                                     I 0360
      MOO = JF - 2                                                       I 0370
      WRITE   (NIW,206)   LC,MEOW,MOO                                    I 0380
  207 FORMAT   (20H0LIQUID FEED RATE =  ,0PE17.8, 5X,18HVAPOR FEED RATE  I 0390
     1=  ,E17.8, 5X,19HFEED TEMPERATURE =  ,E17.8)                       I 0400
      WRITE   (NIW,207)   LF,VF,TF                                       I 0410
  208 FORMAT   (70H0LIQUID FEED COMPOSITION      VAPOR FEED COMPOSITION  I 0420
     1     BY COMPONENT  ,/, (0PE20.8,E28.8,I16))                        I 0430
      WRITE   (NIW,208)   (XF(I),YF(I),I,I=1,LC)                         I 0440
  209 FORMAT   (79H0TRAY      TEMPERATURE      VAPOR FLOW RATE      LIQU  I 0450
     1ID FLOW RATE      HOLD UP  ,/,(I4,0PE20.6,E19.8,E22.8,E22.8))     I 0460
      DO  222  J=1,JT                                                    I 0470
      MIX = J-2                                                          I 0480
      WRITE   (NIW,209)    MIX,TO(J),VO(J),LO(J),UO(J)                   I 0490
  222 CONTINUE                                                           I 0500
C                                                                        I 0510
      RETURN                                                             I 0520
      END                                                                I 0530
C                                                                        I 0540
      SUBROUTINE   DOUT2                                                 J 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                        J 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)      J 0020
      COMMON   AL(4,4)                                                   J 0030
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)  J 0040
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)   J 0050
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)            J 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAV(09,4)                       J 0070
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) J 0080
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09) J 0090
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                    J 0100
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SBO(4),SDCO(4),SBO(4),SBCA(4)  J 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)               J 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI      J 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERBUB                            J 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5         J 0150
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO    J 0160
      REAL      LFO                                                      J 0170
  210 FORMAT   (13H0COMPOSITIONS ,/,17X,2HC1,24X,2HC2,24X,2HC3,24X,2HC4,  J 0180
     1 /,5H TRAY,4(6X,6HLIQUID,6X,5HVAPOR,2X),/,(I4,3X,F12.8,F12.8,F14.8  J 0190
     2,F12.8,F14.8,F12.8,F14.8,F12.8))                                   J 0200
      DO  211  J=1,JT                                                    J 0210
      MIX = J-2                                                          J 0220
      WRITE   (NIW,210)    MIX,(XO(J,I),YO(J,I),I=1,LC)                  J 0230
  211 CONTINUE                                                           J 0240
  212 FORMAT   (22H0EQUILIBRIUM CONSTANTS,5X,5HCOMP.,12X,2HA1,15X,2HA2,1  J 0250
     15X,2HA3,15X,2HA4,/,(27X,I3,7X,0P4E17.8))                           J 0260
      WRITE   (NIW,212)    (I,(AK(K,I),K=1,4),I=1,LC)                    J 0270
  213 FORMAT   (26H0LIQUID ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HC1,15X,2  J 0280
     1HC2,15X,2HC3,15X,2HC4,/,(31X,I3,7X,0P4E17.8))                      J 0290
      WRITE   (NIW,213)    (I,(AL(K,I),K=1,4),I=1,LC)                    J 0300
  214 FORMAT   (26H0 VAPOR ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HE1,15X,2  J 0310
     1HE2,15X,2HE3,15X,2HE4,/,(31X,I3,0P4E17.8))                         J 0320
      WRITE   (NIW,214)    (I,(AV(K,I),K=1,4),I=1,LC)                    J 0330
  215 FORMAT   (13H0 KB BY TRAY  ,/,(F13.8))                             J 0340
C     WRITE   (NIW,215)    (KB(J),J=1,JT)                                J 0350
C                                                                        J 0360
      RETURN                                                             J 0370
      END                                                                J 0380
C                                                                        J 0390
      SUBROUTINE ONEF                                                    K 0000
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      SUBROUTINE UNCE                                                    B63   K 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                              K 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)           K 0020
      COMMON    AL(4,4)                                                        K 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)       K 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)        K 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)                 K 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)                            K 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)      K 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)      K 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                         K 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)       K 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)                    K 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI           K 0130
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                                 K 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5              K 0150
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO         K 0160
      REAL      LFO                                                            K 0170
      DO  2  J=1,JT                                                            K 0180
      T(J) = TO(J)                                                             K 0190
      L(J) = LO(J)                                                             K 0200
      V(J) = VO(J)                                                             K 0210
      U(J) = UO(J)                                                             K 0220
    2 CONTINUE                                                                 K 0230
C                                                                              K 0240
      DO  3 J=1,JT                                                             K 0250
      DO  3  I=1,LC                                                            K 0260
      ZO(J,I) = 0.0                                                            K 0270
      Z(J,I) = 0.0                                                             K 0280
    3 CONTINUE                                                                 K 0290
C                                                                              K 0300
      FEED = LF + VF                                                           K 0310
      LZ = LO(2)                                                               K 0320
C                                                                              K 0330
      DO  4  I=1,LC                                                            K 0340
      ZO(JF-1,I) = YFO(I) * VFO                                                K 0350
      ZO(JF,I) = XFO(I)*LFO                                                    K 0360
      Z(JF-1,I) = YF(I) * VF                                                   K 0370
      Z(JF,I) = XF(I) * LF                                                     K 0380
      CXF(I)  = (Z(JF-1,I) + Z(JF,I)) / FEED                                   K 0390
      CXFO(I) = (ZO(JF-1,I)+ZO(JF,I))/FEED                                     K 0400
    4 CONTINUE                                                                 K 0410
C                                                                              K 0420
      SIG  =  (1.0-MU)/MU                                                      K 0430
C                                                                              K 0440
      DO  400  I=1,LC                                                          K 0450
      SVO(JT,I) = 0.0                                                          K 0460
      AO(1,I) = 0.0                                                            K 0470
      SVO(1,I) = 0.0                                                           K 0480
  400 CONTINUE                                                                 K 0490
C                                                                              K 0500
      DO  6  J=2,JR                                                            K 0510
      DO  5  I=1,LC                                                            K 0520
      SVO(J,I) = VO(J)*YO(J,I)                                                 K 0530
      SUO(J,I) = UO(J) * XO(J,I)                                               K 0540
      SLO(J,I) = LO(J) * XO(J,I)                                               K 0550
    5 CONTINUE                                                                 K 0560
      TAUO(J) = UO(J)/LO(J)/DELT                                               K 0570
    6 CONTINUE                                                                 K 0580
C                                                                              K 0590
      DO  7  I=1,LC                                                            K 0600
      SDO(I) = SVO(2,I)                                                        K 0610
      SBO(I) = SLO(JR,I)                                                       K 0620
    7 CONTINUE                                                                 K 0630
C                                                                              K 0640
      KTIM = 1                                                                 K 0650
      TIME = DELT                                                              K 0660
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      TYPE = DELT                                                        K 0000
C                                                                        K 0670
      RETURN                                                      B64    K 0680
      END                                                                K 0690
      SUBROUTINE BEGINT                                                  L 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                        L 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)      L 0020
      COMMON   AL(4,4)                                                   L 0030
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)  L 0040
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)   L 0050
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)            L 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)                       L 0070
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) L 0080
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09) L 0090
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                    L 0100
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)  L 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)               L 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI      L 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERBUB                            L 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5         L 0150
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO    L 0160
      REAL     LFO                                                       L 0170
      DO  8  J=2,JR                                                      L 0180
      LOV = LO(J)/VO(J)                                                  L 0190
      DO  8  I=1,LC                                                      L 0200
      IF (J-2)  7,6,7                                                    L 0210
    6 AO(2,I) = LO(2)/D                                                  L 0220
      GO TO 9                                                            L 0230
    7 CONTINUE                                                           L 0240
      AO(J,I) = LOV/EQUILK(AK,I,TO(J))                                   L 0250
    9 CONTINUE                                                           L 0260
      P(J,I) = Z(J,I) + SIG*(ZO(J,I)+ SVO(J+1,I) - (AO(J,I) + 1.0)*SVO(J L 0270
     1,I) + AO(J-1,I)*SVO(J-1,I)) + TAUO(J)*AO(J,I)*SVO(J,I)/MU          L 0280
    8 CONTINUE                                                           L 0290
C                                                                        L 0300
      ITER = 0                                                           L 0310
      FAC = MU * DELT                                                    L 0320
C                                                                        L 0330
      DO  17 J=1,JT                                                      L 0340
      THETA(J) = 1.0                                                     L 0350
   17 CONTINUE                                                           L 0360
      RETURN                                                             L 0370
      END                                                                L 0380
      SUBROUTINE   THETAT                                                M 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                        M 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)      M 0020
      COMMON   AL(4,4)                                                   M 0030
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)  M 0040
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)   M 0050
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)            M 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)                       M 0070
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) M 0080
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09) M 0090
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                    M 0100
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)  M 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)               M 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI      M 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERBUB                            M 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5         M 0150
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO    M 0160
      REAL     LFO                                                       M 0170
      DO  10  J=2,JR                                                     M 0180
      LOV = L(J)/V(J)                                                    M 0190
      TAU(J) = U(J)/L(J)/DELT                                            M 0200
      DO  9  I=1,LC                                                      M 0210
      A(I,J) = LOV/EQUILK(AK,I,T(J))                                     M 0220
      RO(I,I) = 1.0 + A(I,I) * (1.0 + TAU(I)/MU)                         M 0230
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cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

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      R0(J,I) = 2.0 + A(J,I) * (2.0 + TAU(J)/MU)                        M 0230
    9 CONTINUE                                                          M 0240
   10 CONTINUE                                                          M 0250
      DO  11  I=1,LC                                                    M 0260
      A(2,I) = L(2)/D                                                   M 0270
      R0(2,I) = 2.0 + TAU(2)/MU                                         M 0280
   11 CONTINUE                                                          M 0290
C                                                                       M 0300
      RETURN                                                            M 0310
      END                                                               M 0320
      SUBROUTINE   DORAT                                                N 0000
      COMMON     TF0,LF0,VF0,XF0(4),YF0(4),Z0(9,4)                      N 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)     N 0020
      COMMON   AL(4,4)                                                  N 0030
      COMMON   SV0(09,4),SV(09,4),A0(09,4),A(09,4),SU0(09,4),SUC0(09,4) N 0040
      COMMON   Z(09,4),SL0(09,4),SL(09,4),P(09,4),R0(09,4),ISUC0(09,4)  N 0050
      COMMON   X0(09,4),X(09,4),Y0(09,4),Y(09,4),SL0DCA(09,4)           N 0060
      COMMON   SV0DCA(09,4),SU0DCA(09,4),KAY(09,4)                      N 0070
      COMMON   T0(09),T(09),L0(09),L(09),V0(09),V(09),U0(09),U(09),F(09) N 0080
      COMMON   G(09),TAU0(09),TAU(09),THETA(09),SSUC0(09),GE(09),IGE(09) N 0090
      COMMON   DELTH(09),ISSUC0(09),DTHETA(09),KB(09)                   N 0100
      COMMON   CXF0(4),CXF(4),XF(4),YF(4),SD0(4),SDC0(4),SB0(4),SBCA(4) N 0110
      COMMON   SDCA(4),SB0DCA(4),SSU(4),SSUTHD(4),ISDC0(4)              N 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI     N 0130
      COMMON   TCONA,TCONB,COUTY,COUTY0,ERBUB                           N 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5        N 0150
      REAL     ISD0,ISUC0,IGE,ISSD0,L0,LF,L,MU,LOV,KAY,KB,LZ,ISSUC0     N 0160
      REAL      LF0                                                     N 0170
      F(1) = 0.0                                                        N 0180
      G(1) = 0.0                                                        N 0190
      DO  13  I=1,LC                                                    N 0200
      DO  11  J=2,JR                                                    N 0210
      F(J) = 1.0/(-R0(J,I) - A(J-1,I)*F(J-1))                           N 0220
C WOULD BLOW UP IF DENOMENATOR OF F(JR) = 0.0                           N 0230
      G(J) = (-P(J,I) - A(J-1,I)*G(J-1))/(-R0(J,I) - A(J-1,I)*F(J-1))   N 0240
   11 CONTINUE                                                          N 0250
C                                                                       N 0260
      F(JR) = 0.0                                                       N 0270
      SV(JT,I) = 0.0                                                    N 0280
C                                                                       N 0290
      DO  12  JJ=2,JR                                                   N 0300
      J = JT-JJ+1                                                       N 0310
      SV(J,I) = G(J) - F(J)*SV(J+1,I)                                   N 0320
   12 CONTINUE                                                          N 0330
C                                                                       N 0340
   13 CONTINUE                                                          N 0350
C                                                                       N 0360
C                                                                       N 0370
      DO  14  I=1,LC                                                    N 0380
      SDCA(I) = SV(2,I)                                                 N 0390
      SBCA(I) = A(JR,I)*SV(JR,I)                                        N 0400
      SB0DCA(I) = SBCA(I)/SDCA(I)                                       N 0410
   14 CONTINUE                                                          N 0420
C                                                                       N 0430
      DO  15  I=1,LC                                                    N 0440
      DO  15  J=2,JR                                                    N 0450
      SV0DCA(J,I) = SV(J,I)/SDCA(I)                                     N 0460
      SL0DCA(J,I) = SV0DCA(J,I)*A(J,I)                                  N 0470
      SU0DCA(J,I) = SL0DCA(J,I)*U(J)/L(J)                               N 0480
   15 CONTINUE                                                          N 0490
C                                                                       N 0500
      DO  16  I=1,LC                                                    N 0510
      SU0DCA(1,I) = 0.0                                                 N 0520
   16 CONTINUE                                                          N 0530
C                                                                       N 0540
      RETURN                                                            N 0550
      END                                                               N 0560
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      SUBROUTINE   CORDEE                                                    P 0000
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                    B66    P 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)        P 0020
      COMMON    AL(4,4)                                                      P 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)     P 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)      P 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)               P 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAV(09,4)                          P 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)    P 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)    P 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                       P 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)     P 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)                  P 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HTTIME,TIME,ERPHI         P 0130
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                               P 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5            P 0150
      REAL      ISDCO,ISUCO,IGF,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO       P 0160
      REAL       LFO                                                         P 0170
      DO  18  I=1,LC                                                         P 0180
      SSU(I) = SUO(JR,I) + SUO(2,I)                                          P 0190
      SSUTHD(I) = U(2)/D                                                     P 0200
      DO  18  J=3,JL                                                         P 0210
      SSU(I) = SSU(I) + SUO(J,I)                                             P 0220
      SSUTHD(I) = SSUTHD(I) + SUODCA(J,I)*THETA(J)                           P 0230
   18 CONTINUE                                                               P 0240
C                                                                            P 0250
      SSDCO = 0.0                                                            P 0260
C                                                                            P 0270
      DO  20  I=1,LC                                                         P 0280
      SDCO(I) = CORECD(I)                                                    P 0290
      DO  19  J=3,JL                                                         P 0300
      SUCO(J,I) = THETA(J)*SUODCA(J,I)*SDCO(I)                               P 0310
   19 CONTINUE                                                               P 0320
      SUCO(2,I) = (U(2)/D)*SDCO(I)                                           P 0330
      SSDCO = SSDCO + SDCO(I)                                                P 0340
   20 CONTINUE                                                               P 0350
C                                                                            P 0360
      DO  21  J=3,JL                                                         P 0370
      SSUCO(J) = 0.0                                                         P 0380
      DO  21  I=1,LC                                                         P 0390
      SSUCO(J) = SSUCO(J) + SUCO(J,I)                                        P 0400
   21 CONTINUE                                                               P 0410
C                                                                            P 0420
      GE(2) = 0.0                                                            P 0430
      GE(1) = SSDCO - D                                                      P 0440
C                                                                            P 0450
      DO  22  J=3,JL                                                         P 0460
      GE(J) = SSUCO(J) - U(J)                                                P 0470
   22 CONTINUE                                                               P 0480
C                                                                            P 0490
      RETURN                                                                 P 0500
      END                                                                    P 0510
      SUBROUTINE   THET                                                      Q 0000
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                           Q 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)         Q 0020
      COMMON    AL(4,4)                                                      Q 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)     Q 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)      Q 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)               Q 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAV(09,4)                          Q 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)    Q 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)    Q 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                       Q 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)     Q 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)                  Q 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HTTIME,TIME,ERPHI         Q 0130
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      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                    B67   Q 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5       Q 0150
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO  Q 0160
      REAL      LFO                                                     Q 0170
      DO  30  K=1,JL                                                    Q 0180
      DELTH(K) = 0.5E-02*THETA(K)                                       Q 0190
      IF (K-2)  23,30,23                                                Q 0200
   23 CONTINUE                                                          Q 0210
      THETA(K) = THETA(K) + DELTH(K)                                    Q 0220
C                                                                       Q 0230
      ISSDCO = 0.0                                                      Q 0240
C                                                                       Q 0250
      DO  25  I=1,LC                                                    Q 0260
      SSUTHD(I) = SSUTHD(I) + DELTH(K)*SUODCA(K,I)                      Q 0270
      ISDCO(I) = CORECD(I)                                              Q 0280
      DO  24  J=3,JL                                                    Q 0290
      ISUCO(J,I) = THETA(J)*SUODCA(J,I)*ISDCO(I)                        Q 0300
   24 CONTINUE                                                          Q 0310
      ISUCO(2,I) = SUCO(2,I)                                            Q 0320
      ISSDCO = ISSDCO + ISDCO(I)                                        Q 0330
   25 CONTINUE                                                          Q 0340
C                                                                       Q 0350
      DO  26  J=3,JL                                                    Q 0360
      ISSUCO(J) = 0.0                                                   Q 0370
      DO  26  I=1,LC                                                    Q 0380
      ISSUCO(J) = ISSUCO(J) + ISUCO(J,I)                                Q 0390
   26 CONTINUE                                                          Q 0400
C                                                                       Q 0410
      IGE(2) = 0.0                                                      Q 0420
      IGE(1) = ISSDCO - D                                               Q 0430
C                                                                       Q 0440
      DO  27  J=3,JL                                                    Q 0450
      IGE(J) = ISSUCO(J) - U(J)                                         Q 0460
   27 CONTINUE                                                          Q 0470
C                                                                       Q 0480
      DO  29  J=1,JL                                                    Q 0490
      IF (J-2)  28,29,28                                                Q 0500
   28 DGE(J,K) = (IGE(J) - GE(J)) / DELTH(K)                            Q 0510
   29 CONTINUE                                                          Q 0520
C                                                                       Q 0530
      THETA(K) = THETA(K) - DELTH(K)                                    Q 0540
C                                                                       Q 0550
      DO  30  I=1,LC                                                    Q 0560
      SSUTHD(I) = SSUTHD(I) - DELTH(K)*SUODCA(K,I)                      Q 0570
   30 CONTINUE                                                          Q 0580
      DO  301  J=1,JL                                                   Q 0590
      DGE(2,J) = 0.0                                                    Q 0600
      DGE(J,2) = 0.0                                                    Q 0610
  301 CONTINUE                                                          Q 0620
C                                                                       Q 0630
      RETURN                                                            Q 0640
      END                                                               Q 0650
      SUBROUTINE TIGHT                                                  R 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                       R 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)    R 0020
      COMMON    AL(4,4)                                                 R 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)  R 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)   R 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)          R 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)                     R 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)  R 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)  R 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                  R 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)  R 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)             R 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERRHT    R 0130
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      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUR                    B68   R 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5       R 0150
      REAL      ISDCO,ISUCO,IGF,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO  R 0160
      REAL       LFO                                                    R 0170
      JMAX = 6                                                          R 0180
      JMIN = JL-1                                                       R 0190
      DO  307  J=1,JMAX                                                 R 0200
      DO  307  I=1,JMAX                                                 R 0210
      DGC(I,J) = 0.0                                                    R 0220
  307 CONTINUE                                                          R 0230
C                                                                       R 0240
      DO  306  J=1,JL                                                   R 0250
      IF (J-2)  301,303,302                                             R 0260
  301 DGC(1,J) = DGE(1,J)                                               R 0270
      GO TO 303                                                         R 0280
  302 DGC(1,J-1) = DGE(1,J)                                             R 0290
  303 CONTINUE                                                          R 0300
      DO  306  K=3,JL                                                   R 0310
      IF (J-2)  304,306,305                                             R 0320
  304 DGC(K-1,J) = DGE(K,J)                                             R 0330
      GO TO 306                                                         R 0340
  305 DGC(K-1,J-1) = DGE(K,J)                                           R 0350
  306 CONTINUE                                                          R 0360
C                                                                       R 0370
      K = JMIN                                                          R 0380
      DO  308  J=2,JMIN                                                 R 0390
      DO  308  I=1,JMIN                                                 R 0400
      K = K+1                                                           R 0410
      JN = (K-1)/JMAX + 1                                               R 0420
      IN = K - (JN-1)*JMAX                                              R 0430
      DGC(IN,JN) = DGC(I,J)                                             R 0440
  308 CONTINUE                                                          R 0450
      IN = IN+1                                                         R 0460
      DO  309  J=JN,JMAX                                                R 0470
      DO  309  I=IN,JMAX                                                R 0480
      DGC(I,J) = 0.0                                                    R 0490
  309 CONTINUE                                                          R 0500
C                                                                       R 0510
      RETURN                                                            R 0520
      END                                                               R 0530
      SUBROUTINE MINV(A,N,D,L,M)                                        S 0000
      DIMENSION A(1),L(1),M(1)                                          S 0010
C                                                                       S 0020
C     ..................................................................S 0030
C                                                                       S 0040
C        SUBROUTINE MINV                                                S 0050
C                                                                       S 0060
C        PURPOSE                                                        S 0070
C           INVERT A MATRIX                                             S 0080
C                                                                       S 0090
C        USAGE                                                          S 0100
C           CALL MINV(A,N,D,L,M)                                        S 0110
C                                                                       S 0120
C        DESCRIPTION OF PARAMETERS                                      S 0130
C           A - INPUT MATRIX, DESTROYED IN COMPUTATION AND REPLACED BY  S 0140
C               RESULTANT INVERSE.                                      S 0150
C           N - ORDER OF MATRIX A                                       S 0160
C           D - RESULTANT DETERMINANT                                   S 0170
C           L - WORK VECTOR OF LENGTH N                                 S 0180
C           M - WORK VECTOR OF LENGTH N                                 S 0190
C                                                                       S 0200
C        REMARKS                                                        S 0210
C           MATRIX A MUST BE A GENERAL MATRIX                           S 0220
C                                                                       S 0230
C        SUBROUTINES AND FUNCTION SUBPROGRAMS REQUIRED                  S 0240
C           NONE                                                        S 0250
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C                                                                       S 0250
C                                                                       S 0260
C                                                              B69      S 0270
C       METHOD                                                          S 0280
C          THE STANDARD GAUSS-JORDAN METHOD IS USED. THE DETERMINANT    S 0290
C          IS ALSO CALCULATED. A DETERMINANT OF ZERO INDICATES THAT     S 0300
C          THE MATRIX IS SINGULAR.                                      S 0310
C                                                                       S 0320
C     ..................................................................S 0330
C                                                                       S 0340
C     ..................................................................S 0350
C                                                                       S 0360
C       IF A DOUBLE PRECISION VERSION OF THIS ROUTINE IS DESIRED, THE   S 0370
C       C IN COLUMN 1 SHOULD BE REMOVED FROM THE DOUBLE PRECISION       S 0380
C       STATEMENT WHICH FOLLOWS.                                        S 0390
C                                                                       S 0400
C     DOUBLE PRECISION A,D,BIGA,HOLD                                    S 0410
C                                                                       S 0420
C       THE C MUST ALSO BE REMOVED FROM DOUBLE PRECISION STATEMENTS     S 0430
C       APPEARING IN OTHER ROUTINES USED IN CONJUNCTION WITH THIS       S 0440
C       ROUTINE.                                                        S 0450
C                                                                       S 0460
C       THE DOUBLE PRECISION VERSION OF THIS SUBROUTINE MUST ALSO       S 0470
C       THE DOUBLE PRECISION VERSION OF THIS SUBROUTINE MUST ALSO       S 0480
C       CONTAIN DOUBLE PRECISION FORTRAN FUNCTIONS.  ABS IN STATEMENT   S 0490
C       10 MUST BE CHANGED TO DABS.                                     S 0500
C                                                                       S 0510
C     ..................................................................S 0520
C                                                                       S 0530
C       SEARCH FOR LARGEST ELEMENT                                      S 0540
C                                                                       S 0550
      D=1.0                                                             S 0560
      NK=-N                                                             S 0570
      DO 80 K=1,N                                                       S 0580
      NK=NK+N                                                           S 0590
      L(K)=K                                                            S 0600
      M(K)=K                                                            S 0610
      KK=NK+K                                                           S 0620
      BIGA=A(KK)                                                        S 0630
      DO 20 J=K,N                                                       S 0640
      IZ=N*(J-1)                                                        S 0650
      DO 20 I=K,N                                                       S 0660
      IJ=IZ+I                                                           S 0670
   10 IF( ABS(BIGA)- ABS(A(IJ))) 15,20,20                               S 0680
   15 BIGA=A(IJ)                                                        S 0690
      L(K)=I                                                            S 0700
      M(K)=J                                                            S 0710
   20 CONTINUE                                                          S 0720
C                                                                       S 0730
C       INTERCHANGE ROWS                                                S 0740
C                                                                       S 0750
      J=L(K)                                                            S 0760
      IF(J-K) 35,35,25                                                  S 0770
   25 KI=K-N                                                            S 0780
      DO 30 I=1,N                                                       S 0790
      KI=KI+N                                                           S 0800
      HOLD=-A(KI)                                                       S 0810
      JI=KI-K+J                                                         S 0820
      A(KI)=A(JI)                                                       S 0830
   30 A(JI) =HOLD                                                       S 0840
C                                                                       S 0850
C       INTERCHANGE COLUMNS                                             S 0860
C                                                                       S 0870
   35 I=M(K)                                                            S 0880
      IF(I-K) 45,45,38                                                  S 0890
   38 JP=N*(I-1)                                                        S 0900
      DO 40 J=1,N                                                       S 0910
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      JK=NK+J                                                    B70    S 0920
      JT=JP+J                                                           S 0930
      HOLD=-A(JK)                                                       S 0940
      A(JK)=A(JI)                                                       S 0950
   40 A(JI) =HOLD                                                       S 0960
C                                                                       S 0970
C        DIVIDE COLUMN BY MINUS PIVOT (VALUE OF PIVOT ELEMENT IS        S 0980
C        CONTAINED IN BIGA)                                             S 0990
C                                                                       S 1000
   45 IF(BIGA) 48,46,48                                                 S 1010
   46 D=0.0                                                             S 1020
      RETURN                                                            S 1030
   48 DO 55 I=1,N                                                       S 1040
      IF(I-K) 50,55,50                                                  S 1050
   50 IK=NK+I                                                           S 1060
      A(IK)=A(IK)/(-BIGA)                                               S 1070
   55 CONTINUE                                                          S 1080
C                                                                       S 1090
C        REDUCE MATRIX                                                  S 1100
C                                                                       S 1110
      DO 65 I=1,N                                                       S 1120
      IK=NK+I                                                           S 1130
      IJ=I-N                                                            S 1140
      DO 65 J=1,N                                                       S 1150
      IJ=IJ+N                                                           S 1160
      IF(I-K) 60,65,60                                                  S 1170
   60 IF(J-K) 62,65,62                                                  S 1180
   62 KJ=IJ-I+K                                                         S 1190
      A(IJ)=A(IK)*A(KJ)+A(IJ)                                           S 1200
   65 CONTINUE                                                          S 1210
C                                                                       S 1220
C        DIVIDE ROW BY PIVOT                                            S 1230
C                                                                       S 1240
      KJ=K-N                                                            S 1250
      DO 75 J=1,N                                                       S 1260
      KJ=KJ+N                                                           S 1270
      IF(J-K) 70,75,70                                                  S 1280
   70 A(KJ)=A(KJ)/BIGA                                                  S 1290
   75 CONTINUE                                                          S 1300
C                                                                       S 1310
C        PRODUCT OF PIVOTS                                              S 1320
C                                                                       S 1330
      D=D*BIGA                                                          S 1340
C                                                                       S 1350
C        REPLACE PIVOT BY RECIPROCAL                                    S 1360
C                                                                       S 1370
      A(KK)=1.0/BIGA                                                    S 1380
   80 CONTINUE                                                          S 1390
C                                                                       S 1400
C        FINAL ROW AND COLUMN INTERCHANGE                               S 1410
C                                                                       S 1420
      K=N                                                               S 1430
  100 K=(K-1)                                                           S 1440
      IF(K) 150,150,105                                                 S 1450
  105 I=L(K)                                                            S 1460
      IF(I-K) 120,120,108                                               S 1470
  108 JQ=N*(K-1)                                                        S 1480
      JR=N*(I-1)                                                        S 1490
      DO 110 J=1,N                                                      S 1500
      JK=JQ+J                                                           S 1510
      HOLD=A(JK)                                                        S 1520
      JI=JR+J                                                           S 1530
      A(JK)=-A(JI)                                                      S 1540
  110 A(JI) =HOLD                                                       S 1550
  120 J=M(K)                                                            S 1560
      IF(J-K) 100,100,125                                               S 1570
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      IF(J-K) 100,100,125                                                    S 1570
  125 KI=K-N                                                                 S 1580
      DO 130 I=1,N                                                    B71    S 1590
      KI=KI+N                                                                S 1600
      HOLD=A(KI)                                                             S 1610
      JI=KI-K+J                                                              S 1620
      A(KI)=-A(JI)                                                           S 1630
  130 A(JI) =HOLD                                                            S 1640
      GO TO 100                                                              S 1650
  150 RETURN                                                                 S 1660
      END                                                                    S 1670
      SUBROUTINE LOOSE                                                       T 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                            T 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)         T 0020
      COMMON    AL(4,4)                                                      T 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)     T 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),TSUCO(09,4)      T 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)               T 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)                          T 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)    T 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)    T 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                       T 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SBO(4),SDCO(4),SBO(4),SBCA(4)     T 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),TSDCO(4)                  T 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI         T 0130
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                               T 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5            T 0150
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO       T 0160
      REAL      LFO                                                          T 0170
      JMAX = 6                                                               T 0180
      JMIN = JL-1                                                            T 0190
      K = JMIN*JMIN+1                                                        T 0200
      DO  320  N=1,JMAX                                                      T 0210
      DO  320  M=1,JMAX                                                      T 0220
      J = JMAX-N+1                                                           T 0230
      I = JMAX-M+1                                                           T 0240
      IF (J-JMIN) 317,317,319                                                T 0250
  317 IF (I-JMIN) 318,318,319                                                T 0260
  318 CONTINUE                                                               T 0270
      K = K-1                                                                T 0280
      JO = (K-1)/JMAX + 1                                                    T 0290
      IO = K - (JO-1)*JMAX                                                   T 0300
      DGC(I,J) = DGC(IO,JO)                                                  T 0310
      GO TO 320                                                              T 0320
  319 CONTINUE                                                               T 0330
      DGC(I,J) = 0.0                                                         T 0340
  320 CONTINUE                                                               T 0350
C                                                                            T 0360
      DO  316  J=1,JL                                                        T 0370
      IF (J-2)  311,313,312                                                  T 0380
  311 DGE(1,J) = DGC(1,J)                                                    T 0390
      GO TO 313                                                              T 0400
  312 DGE(1,J) = DGC(1,J-1)                                                  T 0410
  313 CONTINUE                                                               T 0420
C                                                                            T 0430
      DO  316  K=3,JL                                                        T 0440
      IF (J-2)  314,316,315                                                  T 0450
  314 DGE(K,J) = DGC(K-1,J)                                                  T 0460
      GO TO 316                                                              T 0470
  315 DGE(K,J) = DGC(K-1,J-1)                                                T 0480
  316 CONTINUE                                                               T 0490
C                                                                            T 0500
      RETURN                                                                 T 0510
      END                                                                    T 0520
      SUBROUTINE THETAF                                                      U 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                            U 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)         U 0020
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      COMMON   AL(4,4)
      COMMON   SV0(09,4),SV(09,4),A0(09,4),A(09,4),SU0(09,4),SUC0(09,4)
      COMMON   Z(09,4),SL0(09,4),SL(09,4),P(09,4),R0(09,4),ISUC0(09,4)
      COMMON   X0(09,4),X(09,4),Y0(09,4),Y(09,4),SL0DCA(09,4)
      COMMON   SV0DCA(09,4),SU0DCA(09,4),KAY(09,4)
      COMMON   T0(09),T(09),L0(09),L(09),V0(09),V(09),U0(09),U(09),F(09)
      COMMON   G(09),TAU0(09),TAU(09),THETA(09),SSUC0(09),GE(09),IGE(09)
      COMMON   DELTH(09),ISSUC0(09),DTHETA(09),KB(09)
      COMMON   CXF0(4),CXF(4),XF(4),YF(4),SD0(4),SDC0(4),SB0(4),SBCA(4)
      COMMON   SDCA(4),SB0DCA(4),SSU(4),SSUTHD(4),ISDC0(4)
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON   TCONA,TCONB,CDUTY,CDUTY0,ERBUR
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL     ISDC0,ISUC0,IGE,ISSDC0,L0,LF,L,MU,LOV,KAY,KB,LZ,ISSUC0
      REAL     LF0
      DO  34  J=1,JL
      DTHETA(J) = 0.0
      IF (J-2) 31,34,31
   31 DO  33  K=1,JL
      IF (K-2) 32,33,32
   32 DTHETA(J) = DTHETA(J) - GE(K)*DGE(J,K)
   33 CONTINUE
   34 CONTINUE
C
      DO  351  J=1,JL
      THETA(J) = THETA(J) + DTHETA(J)
      IF (THETA(J)) 350,351,351
  350 THETA(J) = (THETA(J) - DTHETA(J))/2.0
  351 CONTINUE
      RETURN
      END
      SUBROUTINE   TEMPRO
      COMMON    TF0,LF0,VF0,XF0(4),YF0(4),Z0(9,4)
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON   AL(4,4)
      COMMON   SV0(09,4),SV(09,4),A0(09,4),A(09,4),SU0(09,4),SUC0(09,4)
      COMMON   Z(09,4),SL0(09,4),SL(09,4),P(09,4),R0(09,4),ISUC0(09,4)
      COMMON   X0(09,4),X(09,4),Y0(09,4),Y(09,4),SL0DCA(09,4)
      COMMON   SV0DCA(09,4),SU0DCA(09,4),KAY(09,4)
      COMMON   T0(09),T(09),L0(09),L(09),V0(09),V(09),U0(09),U(09),F(09)
      COMMON   G(09),TAU0(09),TAU(09),THETA(09),SSUC0(09),GE(09),IGE(09)
      COMMON   DELTH(09),ISSUC0(09),DTHETA(09),KB(09)
      COMMON   CXF0(4),CXF(4),XF(4),YF(4),SD0(4),SDC0(4),SB0(4),SBCA(4)
      COMMON   SDCA(4),SB0DCA(4),SSU(4),SSUTHD(4),ISDC0(4)
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON   TCONA,TCONB,CDUTY,CDUTY0,ERBUR
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL     ISDC0,ISUC0,IGE,ISSDC0,L0,LF,L,MU,LOV,KAY,KB,LZ,ISSUC0
      REAL     LF0
      DO  36  I=1,LC
      SDC0(I) = CORECD(I)
      SUC0(2,I) = U(2) *SDC0(I) / D
      SUC0(JR,I) = THETA(1) * (U(JR)/L(JR)) * SB0DCA(I) * SDC0(I)
      DO  35  J=3,JL
      SUC0(J,I) = SU0DCA(J,I) * SDC0(I) * THETA(J)
   35 CONTINUE
   36 CONTINUE
C
      DO  360  J=2,JR
      SSUC0(J) = 0.0
      DO  360  I=1,LC
      SSUC0(J) = SSUC0(J) + SUC0(J,I)
  360 CONTINUE
C
      DO  38  J=2,JR
      DO  37  I=1,LC
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cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

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      DO  37  I=1,LC                                                    V 0340
      X(J,I) = SUCO(J,I) / SSUCO(J)                          B73        V 0350
   37 CONTINUE                                                          V 0360
      CALL RUBPT(X,J,TO(J),AK,LC,T(J),ERBUB)                            V 0370
   38 CONTINUE                                                          V 0380
      RETURN                                                            V 0390
      END                                                               V 0400
      SUBROUTINE   PREDIC(KIT)                                          W 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                       W 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)     W 0020
      COMMON   AL(4,4)                                                  W 0030
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4) W 0040
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)  W 0050
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)           W 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAV(09,4)                      W 0070
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) W 0080
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GF(09),IGE(09) W 0090
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                   W 0100
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4) W 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)              W 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI     W 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERBUB                           W 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5        W 0150
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO   W 0160
      REAL     LFO                                                      W 0170
      ITER = ITER + 1                                                   W 0180
      KIT = ITER                                                        W 0190
C                                                                       W 0200
      DO  60  J=1,JL                                                    W 0210
      IF (ABS(THETA(J)-1.0)-ERPHI)  60,60,62                            W 0220
   60 CONTINUE                                                          W 0230
C                                                                       W 0240
      IDIR = 1                                                          W 0250
      IF (TIME-HITIME)  63,63,61                                        W 0260
C                                                                       W 0270
   61 IDIR = -1                                                         W 0280
      RETURN                                                            W 0290
C                                                                       W 0300
   62 IDIR = 0                                                          W 0310
      RETURN                                                            W 0320
C                                                                       W 0330
   63 CONTINUE                                                          W 0340
      KTIM = KTIM + 1                                                   W 0350
C                                                                       W 0360
      DELTO = DELT                                                      W 0370
      IF (KTIM-10) 65,65,64                                             W 0380
   64 DELT = DELT * 2.0                                                 W 0390
      KTIM = 1                                                          W 0400
   65 CONTINUE                                                          W 0410
C                                                                       W 0420
      RETURN                                                            W 0430
      END                                                               W 0440
      SUBROUTINE    RITE1                                               X 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                       X 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)     X 0020
      COMMON   AL(4,4)                                                  X 0030
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4) X 0040
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)  X 0050
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)           X 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAV(09,4)                      X 0070
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) X 0080
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GF(09),IGE(09) X 0090
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                   X 0100
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4) X 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)              X 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI     X 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERBUB                           X 0140
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      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5                X 0150
      DIMENSION   AS(4),BS(4),CS(4),DS(4),ES(4),FS(4)                  B74     X 0160
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO          X 0170
      REAL      LFO                                                            X 0180
  274 FORMAT   (12H1PROBLEM NO.,/,8H TIME = ,F10.3,//,      53HOLIQUID M       X 0190
     1OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)                            X 0200
      WRITE    (NIW,274)    TIME                                              X 0210
  276 FORMAT   (21HO       BOTTOM PRODUCT,/,(5E20.8))                         X 0220
      WRITE    (NIW,276)    (X(JR,I),I=1,LC)                                  X 0230
  277 FORMAT   (19HO       PLATE NO. = ,I3,/,(5E20.8))                        X 0240
      DO  71  K=3,JL                                                          X 0250
      JPLATE = K-2                                                            X 0260
      J = JL-K+3                                                              X 0270
      WRITE    (NIW,277)    JPLATE,(X(J,I),I=1,LC)                            X 0280
   71 CONTINUE                                                                X 0290
  279 FORMAT   (13HO       REFLUX, /,(5E20.8))                                X 0300
      WRITE    (NIW,279)    (X(2,I),I=1,LC)                                   X 0310
  280 FORMAT   (18HO       TOP PRODUCT,/,(5E20.8))                            X 0320
      WRITE    (NIW,280)    (X(2,I),I=1,LC)                                   X 0330
  281 FORMAT   (34HOBOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))             X 0340
      DO  666  I=1,LC                                                         X 0350
      AS(I) = CXF(I) * FEED                                                   X 0360
      BS(I) = L(JR)*X(JR,I)                                                   X 0370
      CS(I) = D*X(2,I)                                                        X 0380
      DS(I) = BS(I)/AS(I)                                                     X 0390
      ES(I) = CS(I)/AS(I)                                                     X 0400
      FS(I) = DS(I) + ES(I)                                                   X 0410
  666 CONTINUE                                                                X 0420
      WRITE    (NIW,281)    (DS(I),I=1,LC)                                    X 0430
  282 FORMAT   (31HOTOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))                X 0440
      WRITE    (NIW,282)    (ES(I),I=1,LC)                                    X 0450
  292 FORMAT   (62HOSUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEA      X 0460
     1DY STATE    ,/,(5E20.8),/)                                              X 0470
      WRITE    (NIW,292)    (FS(I),I=1,LC)                                    X 0480
  283 FORMAT   (27HOMOLES OF FEED AND PRODUCTS)                               X 0490
      WRITE    (NIW,283)                                                      X 0500
  284 FORMAT   (70HO       COMPONENT          FEED          BOTTOM PRODUCT    X 0510
     1      TOP PRODUCT,/,(I11,E22.8,2E19.8))                                 X 0520
      WRITE    (NIW,284)    (I,AS(I),BS(I),CS(I),I=1,LC)                      X 0530
C                                                                             X 0540
      RETURN                                                                  X 0550
      END                                                                     X 0560
C                                                                             X 0570
      SUBROUTINE   RITE2                                                      Y 0000
      COMMON    TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                             Y 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)           Y 0020
      COMMON   AL(4,4)                                                        Y 0030
      COMMON   SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)       Y 0040
      COMMON   Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)        Y 0050
      COMMON   XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)                 Y 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)                            Y 0070
      COMMON   TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)      Y 0080
      COMMON   G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)      Y 0090
      COMMON   DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                         Y 0100
      COMMON   CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)       Y 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHO(4),ISDCO(4)                    Y 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HI,TIMF,TIME,ERPHI          Y 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTYO,ERBUR                                 Y 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5              Y 0150
      DIMENSION   SUM(9)                                                      Y 0160
      REAL     ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO         Y 0170
      REAL      LFO                                                           Y 0180
  285 FORMAT   (2H  ,/,E33.8,2E19.8)                                          Y 0190
      WRITE    (NIW,285)    FEED,L(JR),D                                      Y 0200
      DO  72  J=1,JT                                                          Y 0210
      SUM(J) = 0.0                                                            Y 0220
```



```
      SUM(J) = 0.0                                                      B75
      DO  72  I=1,LC
      SUM(J) = SUM(J) + X(J,I)
   72 CONTINUE
  286 FORMAT   (16H0PLATE VARIABLES)
      WRITE    (NIW,286)
  287 FORMAT   (115H0        SUMMATIONS          TEMPERATURES          VAPOR F
     1LOWS          LIQUID FLOWS     VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,
     2 (6E19.8))
      WRITE    (NIW,287)    (SUM(J) ,T(J),V(J),L(J),H(6,J),H(7,J),J=2,JR)
      RDUTY = CDUTY + L(JR)*H(7,JR) + D*H(6,2) - HF(5)
  288 FORMAT   (18H0CONDENSER LOAD = ,E15.8,/,17H0REBOILER LOAD = ,E15.8
     1,/,7H0PHI = ,E15.8)
      WRITE    (NIW,288)  CDUTY,RDUTY, THETA(JF)
  289 FORMAT   (6H0THETA, 9F12.7)
      WRITE  (NIW,289)    (THETA(J),J=1,JT)
      K = JL-1
      DO  73  J=1,K
      WRITE  (NIW,290)    (DGC(J,I),I=1,K)
   73 CONTINUE
  290 FORMAT   (6H0 DGC  , 2X, 6E16.7,/)
C
C
      RETURN
      END
C
      SUBROUTINE   ENTHAL
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)
      COMMON     DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)
      COMMON     AL(4,4)
      COMMON     SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4)
      COMMON     Z(09,4),SLO(09,4),SL(09,4),P(09,4),RO(09,4),ISUCO(09,4)
      COMMON     XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)
      COMMON     SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON     TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09)
      COMMON     G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09)
      COMMON     DELTH(09),ISSUCO(09),DTHETA(09),KB(09)
      COMMON     CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4)
      COMMON     SDCA(4),SRODCA(4),SSU(4),SSUTHD(4),ISDCO(4)
      COMMON     DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HI,TIME,TIME,ERPHI
      COMMON     TCONA,TCONB,CDUTY,CDUTYO,ERBUB
      COMMON     LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL       ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO
      REAL       LFO
      DO  39  K=1,10
      DO  39  J=1,JT
      H(K,J) = 0.0
   39 CONTINUE
C
      DO  40  K=1,6
      HF(K) = 0.0
   40 CONTINUE
      HF51 = 0.0
      HF52 = 0.0
      HF61 = 0.0
      HF62 = 0.0
C
      DO  43  I=1,LC
      QF = THALP(AV,T(JF),I)
      QF = THALP(AV,TF,I)
      QG = THALP(AL,TF,I)
      QH = THALP(AV,TFO,I)
      QI = THALP(AL,TFO,I)
C
      HS1 = Z(JF-1,I)*QF
      HS2 = Z(JF,I)*QG
      HS01 = ZO(JF-1,I)*QH
```

```
      HS02 = Z0(JF,I)*QI                                                    B76   Z 0410
                                                                                  Z 0420
C                                                                                 Z 0430
      HF(1) = HF(1) + QF*YF(I)                                                    Z 0440
      HF(2) = HF(2) + QF*YF0(I)                                                   Z 0450
      HF(3) = HF(3) + QF*YF(I)                                                    Z 0460
      HF(4) = HF(4) + QH*YF0(I)                                                   Z 0470
      HF51 = HF51 + HS1                                                           Z 0480
      HF52 = HF52 + HS2                                                           Z 0490
      HF61 = HF61 + HS01                                                          Z 0500
      HF62 = HF62 + HS02                                                          Z 0510
   43 CONTINUE                                                                    Z 0520
      HF(5) = (HF51*VF + HF52*LF)/FEED/FEED                                       Z 0530
      HF(6) = (HF61*VF0 + HF62*LF0)/FEED/FEED                                     Z 0540
C                                                                                 Z 0550
      RETURN                                                                      Z 0560
      END                                                                         Z 0570
C                                                                                 AA 0000
      SUBROUTINE   ENTHA2                                                         AA 0010
      COMMON    TF0,LF0,VF0,XF0(4),YF0(4),Z0(9,4)                                 AA 0020
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)               AA 0030
      COMMON   AL(4,4)                                                            AA 0040
      COMMON   SV0(09,4),SV(09,4),A0(09,4),A(09,4),SU0(09,4),SUC0(09,4)           AA 0050
      COMMON   Z(09,4),SL0(09,4),SL(09,4),P(09,4),R0(09,4),ISUC0(09,4)            AA 0060
      COMMON   X0(09,4),X(09,4),Y0(09,4),Y(09,4),SLODCA(09,4)                     AA 0070
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)                                AA 0080
      COMMON   T0(09),T(09),L0(09),L(09),V0(09),V(09),U0(09),U(09),F(09)          AA 0090
      COMMON   G(09),TAU0(09),TAU(09),THETA(09),SSUC0(09),GE(09),IGE(09)          AA 0100
      COMMON   DELTH(09),ISSUC0(09),DTHETA(09),KB(09)                             AA 0110
      COMMON   CXF0(4),CXF(4),XF(4),YF(4),SD0(4),SDC0(4),SB0(4),SBCA(4)           AA 0120
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDC0(4)                        AA 0130
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HTIME,TIME,ERPHI                AA 0140
      COMMON   TCONA,TCONB,CDUTY,CDUTY0,ERRUB                                     AA 0150
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5                  AA 0160
      REAL     ISDC0,ISUC0,IGE,ISSDC0,L0,LF,L,MU,LOV,KAY,KB,LZ,ISSUC0             AA 0170
      REAL      LF0                                                               AA 0180
      DO  43  I=1,LC                                                              AA 0190
      DO  42  M=1,JR                                                              AA 0200
      J = M+1                                                                     AA 0210
      QA = THALP(AV,T(J),I)                                                       AA 0220
      QB = THALP(AV,T0(J),I)                                                      AA 0230
      QC = THALP(AL,T(M),I)                                                       AA 0240
      QD = THALP(AL,T0(M),I)                                                      AA 0250
C                                                                                 AA 0260
      H(1,J) = H(1,J) + QA* X(M,I)                                                AA 0270
      H(2,J) = H(2,J) + QA* X0(M,I)                                               AA 0280
      H(3,J) = H(3,J) + QA* X(2,I)                                                AA 0290
      H(4,J) = H(4,J) + QA* X0(2,I)                                               AA 0300
      H(5,J) = H(5,J) + QA* Y0(J,I)                                               AA 0310
      H(6,J) = H(6,J) + QB* Y0(J,I)                                               AA 0320
      H(7,M) = H(7,M) + QC* X(M,I)                                                AA 0330
      H(8,M) = H(8,M) + QD* X0(M,I)                                               AA 0340
      IF (J-JF)  42,42,41                                                         AA 0350
   41 H(9,J) = H(9,J) + QA*CXF(I)                                                 AA 0360
      H(10,J) = H(10,J) + QA*CXF0(I)                                              AA 0370
   42 CONTINUE                                                                    AA 0380
   43 CONTINUE                                                                    AA 0390
C                                                                                 AA 0400
      RETURN                                                                      AA 0410
      END                                                                         AA 0420
C                                                                                 BB 0000
      SUBROUTINE   LCORR                                                          BB 0010
      COMMON    TF0,LF0,VF0,XF0(4),YF0(4),Z0(9,4)                                 BB 0020
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)               BB 0030
      COMMON   AL(4,4)                                                            BB 0040
      COMMON   SV0(09,4),SV(09,4),A0(09,4),A(09,4),SU0(09,4),SUC0(09,4)           BB 0050
      COMMON   Z(09,4),SL0(09,4),SL(09,4),P(09,4),R0(09,4),ISUC0(09,4)            BB 0060
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
      COMMON   X0(09,4),X(09,4),Y0(09,4),Y(09,4),SLODCA(09,4)                  B77
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)
      COMMON   T0(09),T(09),L0(09),L(09),V0(09),V(09),U0(09),U(09),F(09)
      COMMON   G(09),TAU0(09),TAU(09),THETA(09),SSUC0(09),GE(09),IGE(09)
      COMMON   DELTH(09),ISSUC0(09),DTHETA(09),KB(09)
      COMMON   CXF0(4),CXF(4),XF(4),YF(4),SD0(4),SDC0(4),SB0(4),SBCA(4)
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDC0(4)
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI
      COMMON   TCONA,TCONB,CDUTY,CDUTY0,ERBUB
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5
      REAL     ISDC0,ISUC0,IGE,ISSDC0,L0,LF,L,MU,L0V,KAY,KB,LZ,ISSUC0
      REAL     LF0
      CDUTY =  (L(2)+D)*(H(1,3)-H(7,2))+SIG*((L0(2)+D)*(H(2,3)-H(8,2))-
     1     V0(3)*(H(5,3)-H(6,3))-CDUTY0) + (U(2)*(H(1,3)-H(7,2)) -
     2     U0(2)*(H(2,3)-H(8,2)))/FAC
C
      SH1= VF*(HF(1) - HF(3)) + SIG*VF0*(HF(2)-HF(4))
C
       DO  490  J=3,JL
      M = J+1
      IF (M-JF)  44,45,46
   44 SH = 0.0
       GO TO 47
   45 SH = SH1
      GO TO 47
   46 SH = FEED*(H(9,M)-HF(5)) + SIG*FEED*(H(10,M)-HF(6))
   47 CONTINUE
      HSUM = 0.0
      DO  49  K=2,J
      HS = 0.0
      HS0 = 0.0
      DO  480  I=1,LC
      HS = HS + THALP(AV,T(M),I)* X(K,I)
      HS0 = HS0 + THALP(AV,T(M),I)* X0(K,I)
  480 CONTINUE
      HSUM = HSUM + U(K)*(HS-H(7,K)) - U0(K)*(HS0-H(8,K))
   49 CONTINUE
C
      H0 = H(1,M) - H(7,J)
      L(J) = (-D*(H(3,M)-H(7,2))+CDUTY+SIG*(V0(M)*(H(5,M)-H(6,M)) -
     1     L0(J)*(H(2,M)-H(8,J)) - D*(H(4,M)-H(8,2)) + CDUTY0)) / H0
     2     - HSUM/FAC/H0 + SH/H0
C
  490 CONTINUE
C
      RETURN
      END
C
      SUBROUTINE   LCORR2                                                      CC 0000
      COMMON   TF0,LF0,VF0,XF0(4),YF0(4),Z0(9,4)                               CC 0010
      COMMON   DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)            CC 0020
      COMMON   AL(4,4)                                                         CC 0030
      COMMON   SV0(09,4),SV(09,4),A0(09,4),A(09,4),SU0(09,4),SUC0(09,4)        CC 0040
      COMMON   Z(09,4),SL0(09,4),SL(09,4),P(09,4),R0(09,4),ISUC0(09,4)         CC 0050
      COMMON   X0(09,4),X(09,4),Y0(09,4),Y(09,4),SL0DCA(09,4)                  CC 0060
      COMMON   SVODCA(09,4),SUODCA(09,4),KAY(09,4)                             CC 0070
      COMMON   T0(09),T(09),L0(09),L(09),V0(09),V(09),U0(09),U(09),F(09)       CC 0080
      COMMON   G(09),TAU0(09),TAU(09),THETA(09),SSUC0(09),GE(09),IGE(09)       CC 0090
      COMMON   DELTH(09),ISSUC0(09),DTHETA(09),KB(09)                          CC 0100
      COMMON   CXF0(4),CXF(4),XF(4),YF(4),SD0(4),SDC0(4),SB0(4),SBCA(4)        CC 0110
      COMMON   SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDC0(4)                     CC 0120
      COMMON   DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI            CC 0130
      COMMON   TCONA,TCONB,CDUTY,CDUTY0,ERBUB                                  CC 0140
      COMMON   LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5               CC 0150
      REAL     ISDC0,ISUC0,IGE,ISSDC0,L0,LF,L,MU,L0V,KAY,KB,LZ,ISSUC0          CC 0160
      REAL     LF0                                                             CC 0170
```

```
      REAL        LFO                                                    CC 0170
      USUM = 0.0                                                         CC 0180
      DO  50  J=2,JR                                          B78        CC 0190
      USUM = USUM + (U(J)-UO(J))                                         CC 0200
   50 CONTINUE                                                           CC 0210
      L(JR) = (FEED-D) + SIG*(FEED-D-LO(JR)) - USUM/FAC                  CC 0220
C                                                                        CC 0230
      MM = JL-1                                                          CC 0240
      DO  56  J=3,MM                                                     CC 0250
      M = J+1                                                            CC 0260
      USUM = 0.0                                                         CC 0270
      DO  51  K=2,J                                                      CC 0280
      USUM = USUM + (U(K) - UO(K))                                       CC 0290
   51 CONTINUE                                                           CC 0300
C                                                                        CC 0310
      IF (M-JF) 52,53,54                                                 CC 0320
   52 Z1 = 0.0                                                           CC 0330
      GO TO 55                                                           CC 0340
   53 Z1 = VF                                                            CC 0350
      GO TO 55                                                           CC 0360
   54 Z1 = FEED                                                          CC 0370
   55 CONTINUE                                                           CC 0380
      V(M) = L(J) + D - Z1 - SIG*(VO(M)+Z1-LO(J)-D) + USUM/FAC           CC 0390
   56 CONTINUE                                                           CC 0400
C                                                                        CC 0410
      V(JR) = L(JL)-L(JR)+SIG*(LO(JL)-LO(JR)-VO(JR))-(U(JR)-UO(JR))/FAC  CC 0420
C                                                                        CC 0430
      RETURN                                                             CC 0440
      END                                                                CC 0450
      SUBROUTINE   NEWTIM                                                DD 0000
      COMMON     TFO,LFO,VFO,XFO(4),YFO(4),ZO(9,4)                       DD 0010
      COMMON    DGE(09,09),DGC(06,06),H(11,09),HF(6),AK(4,4),AV(4,4)     DD 0020
      COMMON    AL(4,4)                                                  DD 0030
      COMMON    SVO(09,4),SV(09,4),AO(09,4),A(09,4),SUO(09,4),SUCO(09,4) DD 0040
      COMMON    Z(09,4),SLO(09,4),SL(09,4),P(09,4),PO(09,4),ISUCO(09,4)  DD 0050
      COMMON    XO(09,4),X(09,4),YO(09,4),Y(09,4),SLODCA(09,4)           DD 0060
      COMMON    SVODCA(09,4),SUODCA(09,4),KAY(09,4)                      DD 0070
      COMMON    TO(09),T(09),LO(09),L(09),VO(09),V(09),UO(09),U(09),F(09) DD 0080
      COMMON    G(09),TAUO(09),TAU(09),THETA(09),SSUCO(09),GE(09),IGE(09) DD 0090
      COMMON    DELTH(09),ISSUCO(09),DTHETA(09),KB(09)                   DD 0100
      COMMON    CXFO(4),CXF(4),XF(4),YF(4),SDO(4),SDCO(4),SBO(4),SBCA(4) DD 0110
      COMMON    SDCA(4),SBODCA(4),SSU(4),SSUTHD(4),ISDCO(4)              DD 0120
      COMMON    DELT,MU,SIG,FAC,D,FEED,LF,VF,TF,LZ,HITIME,TIME,ERPHI     DD 0130
      COMMON    TCONA,TCONB,CDUTY,CDUTYO,ERBUB                           DD 0140
      COMMON    LC,JC,JF,JL,JR,JT,NIC,NIW,IREF,KTIM,ITER,IDIR,IS5        DD 0150
      REAL      ISDCO,ISUCO,IGE,ISSDCO,LO,LF,L,MU,LOV,KAY,KB,LZ,ISSUCO   DD 0160
      REAL       LFO                                                     DD 0170
      DO  70  J=2,JR                                                     DD 0180
      TN = T(J) + (T(J) - TO(J))/DELTO * DELT                            DD 0190
      TO(J) = T(J)                                                       DD 0200
      T(J) = TN                                                          DD 0210
C                                                                        DD 0220
      VN = V(J) + (V(J) - VO(J))/DELTO * DELT                            DD 0230
      VO(J) = V(J)                                                       DD 0240
      V(J) = VN                                                          DD 0250
C                                                                        DD 0260
      IF (J-JF+1)  66,67,68                                              DD 0270
   66 Z1 = 0.0                                                           DD 0280
      GO TO 69                                                           DD 0290
   67 Z1 = VF                                                            DD 0300
      GO TO 69                                                           DD 0310
   68 Z1 = FEED                                                          DD 0320
   69 CONTINUE                                                           DD 0330
C                                                                        DD 0340
      LN = V(J+1)+Z1-D + SIG*(VO(J+1) + Z1-LO(J)-D)                      DD 0350
      LO(J) = L(J)                                                       DD 0360
      L(J) = LN                                                          DD 0370
```



```
      L(3) = L1
C
   70 CONTINUE                                                        B79
C
      V0(2) = D
      V(2) = D
      L(2) = LZ
      L0(2) = LZ
      TIME=TIME + DELT
      DO  77  J=2,JR
      DO  76  I=1,LC
      X0(J,I) = X(J,I)
      Y0(J,I) = EQUILK(AK,I,T0(J))* X(J,I)
      SV0(J,I) = V0(J) * Y0(J,I)
      SU0(J,I) = SUC0(J,I)
      Z0(J,I) = Z(J,I)
   76 CONTINUE
      TAU0(J) = TAU(J)
      U0(J) = U(J)
   77 CONTINUE
C
      DO  78  I=1,LC
      SR0(I) = L(JR)*X(JR,I)
      S0(I) = D * X(2,I)
      CXF0(I) = CXF(I)
   78 CONTINUE
C
      DO  79  I=1,LC
      Y0(2,I) = X0(2,I)
      SV0(2,I) = X0(2,I) * D
   79 CONTINUE
      RETURN
      END
```

```
DD 0380
DD 0390
DD 0400
DD 0410
DD 0420
DD 0430
DD 0440
DD 0450
DD 0460
DD 0470
DD 0480
DD 0490
DD 0500
DD 0510
DD 0520
DD 0530
DD 0540
DD 0550
DD 0560
DD 0570
DD 0580
DD 0590
DD 0600
DD 0610
DD 0620
DD 0630
DD 0640
DD 0650
DD 0660
DD 0670
DD 0680
DD 0690
```

BF - Listagem do Programa para o Método de Euler, utilizado para o Exemplo III.2.B

```
      PROGRAM EULER (INPUT,OUTPUT,TAPE1=OUTPUT,TAPE2=INPUT)                A 0000
      COMMON    T(9),ERPHI,X(9,4),M(11,9),MF(6),L(9),U(9),V(9),TF,SIG,MU   A 0010
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                         A 0020
      COMMON    TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)  A 0030
      COMMON    LFO,VFO,TFO                                                A 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)     A 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)     A 0060
      COMMON    A(9,4),TIME,DELT,MITIME,LF,VF,FEED                         A 0070
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                            A 0080
      COMMON    NIC,NIW                                                    A 0090
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                              A 0100
      REAL      LFO                                                        A 0110
      NIW = 1                                                              A 0120
      NIC = 2                                                              A 0130
      K1 = 1                                                               A 0140
      CALL SECOND(TIM)                                                     A 0145
      PRINT  789,    TIM                                                   A 0146
      KO = 1                                                               A 0150
 6000 CONTINUE                                                             A 0160
      CALL DATAD(IS5)                                                      A 0170
      CALL DOUT1                                                           A 0180
      CALL DOUT2                                                           A 0190
      CALL ONCE                                                            A 0200
      FAC = MU*DELT                                                        A 0210
 6060 FORMAT   (21H1FOR THIS RUN DELT =  ,F20.4,1H1)                       A 0220
      WRITE    (NIW,6060) DELT                                             A 0230
      TIME = 0.0                                                           A 0240
      K = 0                                                                A 0250
 1000 CONTINUE                                                             A 0260
      TIME = TIME + DELT                                                   A 0270
      CALL SECOND(TIM)                                                     A 0275
      PRINT  789,    TIM                                                   A 0276
  789 FORMAT  (*  SECONDS FROM START  =  *, F8.3)                          A 0277
C                                                                          A 0280
      DO  30  J=2,JR                                                       A 0290
      DO  30  I=1,LC                                                       A 0300
      A(J,I) = Z(J,I) + SVO(J+1,I) + SLO(J-1,I) - SVO(J,I) - SLO(J,I)      A 0310
   30 CONTINUE                                                             A 0320
      DO  31  J=2,JR                                                       A 0330
      DO  31 I=1,LC                                                        A 0340
      SUO(J,I) = SUO(J,I) + DELT*A(J,I)                                    A 0350
   31 CONTINUE                                                             A 0360
      DO  36  J=2,JR                                                       A 0370
      SSU(J) = 0.0                                                         A 0380
      DO  36  I=1,LC                                                       A 0390
      SSU(J) = SSU(J) + SUO(J,I)                                           A 0400
   36 CONTINUE                                                             A 0410
      DO  38  J=2,JR                                                       A 0420
      DO  37  I=1,LC                                                       A 0430
      X(J,I) = SUO(J,I)/SSU(J)                                             A 0440
   37 CONTINUE                                                             A 0450
      CALL BUBPT(X,J,TO(J),AK,LC,T(J),ERPHI)                               A 0460
   38 CONTINUE                                                             A 0470
      CALL ENTHAL                                                          A 0480
      CALL ENTHA2                                                          A 0490
      CALL LCORR                                                           A 0500
      CALL LCORR2                                                          A 0510
```

```
      DO  339  J=2,JR                                                    A 0520
      DO  338  I=1,LC                                                    A 0530
      XO(J,I) = X(J,I)                                                   A 0540
      YO(J,I) = EQUILK(AK,I,I(J))*XO(J,I)                                A 0550
  338 CONTINUE                                                           A 0560
      TO(J) = T(J)                                                       A 0570
      LO(J) = L(J)                                                       A 0580
      VO(J) = V(J)                                                       A 0590
      UO(J) = U(J)                                                       A 0600
  339 CONTINUE                                                           A 0610
      DO  40  J=2,JR                                                     A 0620
      DO  40  I=1,LC                                                     A 0630
      SVO(J,I) = VO(J) * YO(J,I)                                         A 0640
      SLO(J,I) = LO(J) * XO(J,I)                                         A 0650
   40 CONTINUE                                                           A 0660
      DO  440  I=1,LC                                                    A 0670
      SVO(2,I) = VO(2)*XO(2,I)                                           A 0680
      ZO(JF-1,I) = Z(JF-1,I)                                             A 0690
      ZO(JF,I) = Z(JF,I)                                                 A 0700
      YO(2,I) = XO(2,I)                                                  A 0710
      CAFO(I) = CAF(I)                                                   A 0720
      XFO(I) = XF(I)                                                     A 0730
      YFO(I) = YF(I)                                                     A 0740
  440 CONTINUE                                                           A 0750
      TFO = TF                                                           A 0760
      LFO = LF                                                           A 0770
      VFO = VF                                                           A 0780
      K = K+1                                                            A 0790
      IF (K-K/155*155)  1000,2000,1000                                   A 0800
 2000 CONTINUE                                                           A 0810
      CALL KITE1                                                         A 0820
      CALL KITE2                                                         A 0830
      IF (TIME-HITIME+1.0E-6)   1000,3000,3000                           A 0840
 3000 CONTINUE                                                           A 0850
      IF (KO-3)  4000,4000,5000                                          A 0860
 4000 CONTINUE                                                           A 0870
      KO = KO + 1                                                        A 0880
      GO TO 6000                                                         A 0890
 5000 CONTINUE                                                           A 0900
      CALL EXIT                                                          A 0910
      END                                                                A 0920
C                                                                        A 0930
```

```
      FUNCTION   EQUILK(A,I,Q)                                          B 0000
      DIMENSION   A(4,4)                                                B 0010
      T = Q+459.69                                                      B 0020
      Z = ((A(4,I)*T+A(3,I))*T+A(2,I))*T+A(1,I)                         B 0030
      EQUILK = Z*Z*Z*I                                                  B 0040
      RETURN                                                            B 0050
      END                                                               B 0060
C                                                                       B 0070
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
      FUNCTION   THALP(A,Q,I)                                          C 0000
      DIMENSION A(4,4)                                                 C 0010
      T = Q+459.69                                                     C 0020
      Z = (A(3,I)*T+A(2,I))*T+A(1,I)                                   C 0030
      THALP = Z*Z                                                      C 0040
      RETURN                                                           C 0050
      END                                                              C 0060
C                                                                      C 0070
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
      SUBROUTINE   BUBPT(X,J,TT,A,L,T,BPERR)                                D 0000
      DIMENSION    X(9,4),A(4,4)                                            D 0010
C                                                                           D 0020
C     SUBROUTINE FOR CALCULATING BUBBLE POINTS                              D 0030
C                                                                           D 0040
      NIW = 1                                                               D 0050
      KTIMES = 1                                                            D 0060
      IBP = -1                                                              D 0070
      T = TT                                                                D 0080
    3 SUMY = 0.0                                                            D 0090
      IBP = IBP + 1                                                         D 0100
      DO  4  I=1,L                                                          D 0110
      Y = EQUILK(A,I,T)*X(J,I)                                              D 0120
      SUMY = SUMY + Y                                                       D 0130
    4 CONTINUE                                                              D 0140
      IF (ABS(SUMY-1.0)-BPERR) 8,8,5                                        D 0150
    5 KTIMES = KTIMES - 1                                                   D 0160
      IF (KTIMES) 7,6,6                                                     D 0170
    6 SUMYO = SUMY                                                          D 0180
      TO = T                                                                D 0190
      T = T + 10.0                                                          D 0200
      GO TO 3                                                               D 0210
    7 CONTINUE                                                              D 0220
      IF (T-TO)  10,11,10                                                   D 0230
   10 CONTINUE                                                              D 0240
      SLOPE = (SUMY-SUMYO)/(T-TO)                                           D 0250
      IF (SLOPE)  12,11,12                                                  D 0260
   12 CONTINUE                                                              D 0270
      TN = ((1.0-SUMY) / SLOPE) + T                                         D 0280
      SUMYO = SUMY                                                          D 0290
      TO = T                                                                D 0300
      T = TN                                                                D 0310
      GO TO 3                                                               D 0320
    8 CONTINUE                                                              D 0330
      WRITE    (NIW,101)    IBP                                             D 0340
  101 FORMAT    (110X,3HBP ,I4)                                             D 0350
      RETURN                                                                D 0360
   11 CONTINUE                                                              D 0370
      ZILCH = 1.0-SUMY                                                      D 0380
      WRITE    (NIW,102)    SUMY,SUMYO,T,TO,SLOPE,ZILCH,BPERR,IBP           D 0390
  102 FORMAT    (1H0,30(1H*),//,43H WARNING. ZERO DENOMINATOR IN BUBBLE P   D 0400
     1OINT    ,//,20H SUM OF Y           = , 0PE20.9,/,                     D 0410
     3  20H OLD SUM OF Y      = ,  E20.9,/, 20H TEMPERATURE (F)   = ,       D 0420
     6  E20.9,/,     20H OLD TEMP    (F)    = ,  E20.9,/,                   D 0430
     7  20H SLOPE             = ,  E20.9,/,                                 D 0440
     9  20H 1.0 - SUM OF Y    = ,  E20.9,/,                                 D 0450
     1  20H ERROR LIMIT       = ,  E20.9,/,                                 D 0460
     2  20H NO OF ITERATIONS = ,  I5,// 90(1H*),//)                         D 0470
      RETURN                                                                D 0480
      END                                                                   D 0490
C                                                                           D 0500
```

cm 1 2 3 4 5 6 7 unesp 11 12 13 14 15 16 17 18

```
      SUBROUTINE   DATAD(IO)                                                    E 0000
      COMMON    I(9),ERPHI,X(9,4),M(11,9),MF(6),L(9),U(9),V(9),TF,SIG,MU        E 0010
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                              E 0020
      COMMON    IO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)      E 0030
      COMMON    LFO,VFO,TFO                                                    E 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)         E 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSO(9),KB(9),KAY(9,4),AK(4,4)         E 0060
      COMMON    A(9,4),TIME,DELT,MITIME,LF,VF,FEED                             E 0070
      COMMON    ITER,LC,JI,JK,JL,JF,ISS,NOV(10)                                E 0080
      COMMON    NIC,NIW                                                        E 0090
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                  E 0100
      REAL      LFO                                                            E 0110
      READ     (NIC,201)    LC,NT,NF,IREF,ISS                                 E 0120
      IO = ISS                                                                 E 0130
      READ     (NIC,202)    ((AK(K,I),K=1,4),I=1,LC)                          E 0140
      READ     (NIC,202)    ((AL(K,I),K=1,4),I=1,LC)                          E 0150
      READ     (NIC,202)    ((AV(K,I),K=1,4),I=1,LC)                          E 0160
      JC = 2                                                                   E 0170
      JF = NF+2                                                                E 0180
      JL = NT+2                                                                E 0190
      JK = NT+3                                                                E 0200
      JI = NT+4                                                                E 0210
      READ     (NIC,202)    (IO(J),J=1,JI)                                    E 0220
      READ     (NIC,202)    (VO(J),J=1,JI)                                    E 0230
      READ     (NIC,202)    (LO(J),J=1,JI)                                    E 0240
      READ     (NIC,202)    (UO(J),J=1,JI)                                    E 0250
      READ     (NIC,202)    TFO,LFO,VFO                                       E 0260
      READ     (NIC,202)    TF, LF, VF                                        E 0270
      READ      (NIC,202)    D                                                E 0280
      READ      (NIC,202)    MU, DELT, ERPHI, MITIME                          E 0290
      READ      (NIC,202)    TCONA, TCONB, CDUTYO, ERBOB                      E 0300
C                                                                              E 0310
      DO  1  J=1,JI                                                            E 0320
      READ      (NIC,203)    (XO(J,I),I=1,LC)                                E 0330
      READ      (NIC,203)    (YO(J,I),I=1,LC)                                E 0340
    1 CONTINUE                                                                 E 0350
      READ     (NIC,203)    (XFO(I),I=1,LC)                                  E 0360
      READ     (NIC,203)    (YFO(I),I=1,LC)                                  E 0370
      READ      (NIC,203)    (XF(I),I=1,LC)                                  E 0380
      READ      (NIC,203)    (YF(I),I=1,LC)                                  E 0390
C                                                                              E 0400
C     READ      (NIC,203)    (KB(J),J=1,JT)                                  E 0410
C                                                                              E 0420
  201 FORMAT    (10I5)                                                         E 0430
  202 FORMAT    (4E20.8)                                                       E 0440
  203 FORMAT    (8F10.0)                                                       E 0450
C                                                                              E 0460
      RETURN                                                                   E 0470
      END                                                                      E 0480
C                                                                              E 0490
```



```
      SUBROUTINE   DOUT1                                                    F 0000
      COMMON   I(9),ERPHI,X(9,4),M(11,9),MF(6),L(9),U(9),V(9),TF,SIG,MU     F 0010
      COMMON    FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                           F 0020
      COMMON   TO(9),SUM(9),AL(4,4),AV(4,4),Z0(9,4),Y(9,4),YFO(4),XFO(4)    F 0030
      COMMON   LFO,VFO,TFO                                                  F 0040
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)       F 0050
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSO(9),KB(9),KAY(9,4),AK(4,4)       F 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                           F 0070
      COMMON   ITER,LC,JT,JK,JL,JF,ISS,NOV(10)                              F 0080
      COMMON   NIC,NIW                                                      F 0090
      REAL     LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                F 0100
      REAL     LFO                                                          F 0110
      DO   626  I=1,LC                                                      F 0120
      X(1,1) = XF(1)                                                        F 0130
      X(9,1) = XFO(1)                                                       F 0140
  626 CONTINUE                                                              F 0150
      CALL BUBPT (X,1,TO(JF),AK,LC,TF,ERPHI)                                F 0160
      CALL BUBPT(X,9,TO(JF),AK,LC,TFO,ERPHI)                                F 0170
      DO  627  J=3,JK                                                       F 0180
      DO  627  I=1,LC                                                       F 0190
      YO(J,1) = EQUILK(AK,1,TO(J))*XO(J,1)                                  F 0200
  627 CONTINUE                                                              F 0210
      DO  628  I=1,LC                                                       F 0220
      YO(2,1) = XO(2,1)                                                     F 0230
  628 CONTINUE                                                              F 0240
  205 FORMAT  (57H1INPUT DATA     DYNAMIC DISTILLATION     HOLLANDS METH    F 0250
     100 )                                                                  F 0260
      WRITE   (NIW,205)                                                     F 0270
  206 FORMAT   (36HNO. OF COMPONENTS    STRIPPING PLATES     RECTIFYING     F 0280
     1 PLATES     REFERENCE COMPONENT  ,/,(I10,I22,I21,I22))                F 0290
      MEOW = JL - JF                                                        F 0300
      MOO = JF - 2                                                          F 0310
      WRITE   (NIW,206)   LC,MEOW,MOO                                       F 0320
  207 FORMAT   (20HLIQUID FEED RATE =  ,0PE17.6, 5X,18HVAPOR FEED RATE      F 0330
     1=  ,E17.8, 5X,19HFEED TEMPERATURE =  ,E17.8)                          F 0340
      WRITE   (NIW,207)   LF,VF,TF                                          F 0350
  208 FORMAT   (/20HLIQUID FEED COMPOSITION      VAPOR FEED COMPOSITION     F 0360
     1     BY COMPONENT  ,/, (0PE20.8,E20.8,I10))                           F 0370
      WRITE   (NIW,208)   (XF(I),YF(I),I,I=1,LC)                            F 0380
  209 FORMAT   (79H0IRAY      TEMPERATURE      VAPOR FLOW RATE      LIQU     F 0390
     1ID FLOW RATE      HOLD UP  ,/,(I4,0PE20.6,E19.6,E22.8,E22.8))        F 0400
      DO  222  J=1,JT                                                       F 0405
      MIX = J-2                                                             F 0410
      WRITE   (NIW,209)    MIX,TO(J),VO(J),LO(J),UO(J)                      F 0420
  222 CONTINUE                                                              F 0425
C                                                                           F 0430
      RETURN                                                                F 0440
      END                                                                   F 0450
C                                                                           F 0460
```

```
      SUBROUTINE   DOUT2                                                    G 0000
      COMMON    T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU    G 0010
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                          G 0020
      COMMON    IO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)   G 0030
      COMMON    LFO,VFO,IFO                                                 G 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)      G 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)      G 0060
      COMMON    A(9,4),TIME,DELT,HTTIME,LF,VF,FEED                          G 0070
      COMMON    ITER,LC,JT,JR,JL,JF,ISS,NOV(10)                             G 0080
      COMMON    NIC,NIW                                                     G 0090
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                               G 0100
      REAL      LFO                                                         G 0110
  210 FORMAT    (13H0COMPOSITIONS ,/,17X,2HC1,24X,2HC2,24X,2HC3,24X,2HC4,   G 0120
     1 /,5H TRAY,4(6X,6HLIQUID,6X,5HVAPOR,2X),/,(I4,3X,F12.8,F12.8,F14.8    G 0130
     2,F12.8,F14.8,F12.8,F14.8,F12.8))                                       G 0140
      DO  211  J=1,JT                                                       G 0150
      MIX = J-2                                                             G 0160
      WRITE    (NIW,210)    MIX,(XO(J,I),YO(J,I),I=1,LC)                    G 0170
  211 CONTINUE                                                              G 0180
  212 FORMAT    (22H0EQUILIBRIUM CONSTANTS,5X,5HCOMP.,12X,2HA1,15X,2HA2,1   G 0190
     15X,2HA3,15X,2HA4,/,(2(7X,I3,7X,0P4E17.8)))                            G 0200
      WRITE    (NIW,212)    (I,(AK(K,I),K=1,4),I=1,LC)                      G 0210
  213 FORMAT    (26H0LIQUID ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HC1,15X,2   G 0220
     1HC2,15X,2HC3,15X,2HC4,/,(31X,I3,7X,0P4E17.8))                         G 0230
      WRITE    (NIW,213)    (I,(AL(K,I),K=1,4),I=1,LC)                      G 0240
  214 FORMAT    (26H0 VAPOR ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HE1,15X,2   G 0250
     1HE2,15X,2HE3,15X,2HE4,/,(31X,I3,0P4E17.8))                            G 0260
      WRITE    (NIW,214)    (I,(AV(K,I),K=1,4),I=1,LC)                      G 0270
  215 FORMAT    (13H0 KB BY TRAY  ,/,(F13.8))                               G 0280
C     WRITE    (NIW,215)    (KB(J),J=1,JT)                                  G 0290
C                                                                           G 0300
      RETURN                                                                G 0310
      END                                                                   G 0320
C                                                                           G 0330
```

```
      SUBROUTINE ONCE                                                    G 0340
      COMMON    T(9),ERPMI,X(9,4),M(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU  G 0350
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                       G 0360
      COMMON    TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4) G 0370
      COMMON    LFO,VFO,TFO                                              G 0380
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)   G 0390
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)   G 0400
      COMMON    A(9,4),TIME,DELT,MITIME,LF,VF,FEED                       G 0410
      COMMON    ITER,LC,JT,JK,JL,JF,ISS,NOV(10)                          G 0420
      COMMON    NIC,NIW                                                  G 0430
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                            G 0440
      REAL      LFO                                                      G 0450
      FEED = LF + VF                                                     G 0460
      SIG  = (1.0-MU)/MU                                                 G 0470
      DO  6  I=1,LC                                                      G 0480
      DO  5  J=1,JT                                                      G 0490
      SVO(J,I) = VO(J) * YO(J,I)                                         G 0500
      SUO(J,I) = UO(J) * XO(J,I)                                         G 0510
      SLO(J,I) = LO(J) * XO(J,I)                                         G 0520
    5 CONTINUE                                                           G 0530
      SLO(1,I) = 0.0                                                     G 0540
      SVO(JT,I) = 0.0                                                    G 0550
    6 CONTINUE                                                           G 0560
C                                                                        G 0570
C                                                                        G 0580
      DO  3  J=1,JT                                                      G 0590
      DO  3  I=1,LC                                                      G 0600
      Z(J,I) = 0.0                                                       G 0610
      ZO(J,I) = 0.0                                                      G 0620
    3 CONTINUE                                                           G 0630
C                                                                        G 0640
      DO  4  I=1,LC                                                      G 0650
      Z(JF-1) = YF(I) * VF                                               G 0660
      Z(JF,I) = XF(I) * LF                                               G 0670
      ZO(JF-1,I) = YFO(I)*VFO                                            G 0680
      ZO(JF,I) = XFO(I)*LFO                                              G 0690
      CXFO(I) = (ZO(JF-1,I) + ZO(JF,I))/FEED                             G 0700
      CXF(I) = (Z(JF-1,I) + Z(JF,I))/FEED                                G 0710
    4 CONTINUE                                                           G 0720
      V(2) = 0                                                           G 0730
      L(2) = LO(2)                                                       G 0740
      V(3) = 0 + L(2)                                                    G 0750
      DO  7  J=1,JT                                                      G 0760
      U(J) = UO(J)                                                       G 0770
    7 CONTINUE                                                           G 0780
C                                                                        G 0790
      RETURN                                                             G 0800
      END                                                                G 0810
C                                                                        G 0820
```

```
      SUBROUTINE    RITE1                                                    H 0000
      COMMON    I(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU     H 0010
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                           H 0020
      COMMON    TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)    H 0030
      COMMON    LFO,VFO,TFO                                                  H 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)       H 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSO(9),KB(9),KAY(9,4),AK(4,4)       H 0060
      COMMON    A(9,4),TIME,DELT,HTIME,LF,VF,FEED                            H 0070
      COMMON    ITER,LC,JT,JR,JL,JF,ISS,NOV(10)                              H 0080
      COMMON    NIC,NIW                                                      H 0090
      DIMENSION   AS(4),BS(4),CS(4),DS(4),ES(4),FS(4)                        H 0100
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                H 0110
      REAL      LFO                                                          H 0120
  274 FORMAT    (12H1PROBLEM NO.,/,8H TIME = ,F10.3,//,       53H0LIQUID M    H 0130
     1OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)                          H 0140
      WRITE     (NIW,274)    TIME                                           H 0150
  276 FORMAT    (21H0       BOTTOM PRODUCT,/,(5E20.8))                       H 0160
      WRITE     (NIW,276)    (X(JR,1),I=1,LC)                               H 0170
  277 FORMAT    (19H0       PLATE NO. = ,I3,/,(5E20.8))                      H 0180
      DO   71   K=3,JL                                                       H 0190
      JPLATE = K-2                                                           H 0200
      J = JL-K+3                                                             H 0210
      WRITE     (NIW,277)    JPLATE,(X(J,I),I=1,LC)                         H 0220
   71 CONTINUE                                                               H 0230
  279 FORMAT    (13H0       REFLUX, /,(5E20.8))                              H 0240
      WRITE     (NIW,279)    (X(2,I),I=1,LC)                                H 0250
  280 FORMAT    (16H0       TOP PRODUCT,/,(5E20.8))                          H 0260
      WRITE     (NIW,280)    (X(2,I),I=1,LC)                                H 0270
  281 FORMAT    (34H0BOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))           H 0280
      DO   666  I=1,LC                                                       H 0290
      AS(I) = CXF(I) * FEED                                                  H 0300
      BS(I) = L(JR)*X(JR,I)                                                  H 0310
      CS(I) = D*X(2,I)                                                       H 0320
      DS(I) = BS(I)/AS(I)                                                    H 0330
      ES(I) = CS(I)/AS(I)                                                    H 0340
      FS(I) = DS(I) + ES(I)                                                  H 0350
  666 CONTINUE                                                               H 0360
      WRITE     (NIW,281)    (DS(I),I=1,LC)                                 H 0370
  282 FORMAT    (31H0TOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))               H 0380
      WRITE     (NIW,282)    (ES(I),I=1,LC)                                 H 0390
  292 FORMAT    (62H0SUMS OF RECOVERY FRACTIONS. SHOULD EQUAL 1.0 AT STEA     H 0400
     1DY STATE   ,/,(5E20.8),/)                                              H 0410
      WRITE     (NIW,292)    (FS(I),I=1,LC)                                 H 0420
  283 FORMAT    (27H0MOLES OF FEED AND PRODUCTS)                             H 0430
      WRITE     (NIW,283)                                                   H 0440
  284 FORMAT    (70H0      COMPONENT           FEED          BOTTOM PRODUCT   H 0450
     1      TOP PRODUCT,/,(I11,E22.8,2E19.8))                               H 0460
      WRITE     (NIW,284)    (I,AS(I),BS(I),CS(I),I=1,LC)                   H 0470
C                                                                            H 0480
      RETURN                                                                 H 0490
      END                                                                    H 0500
C                                                                            H 0510
```

```
      SUBROUTINE   RITE2                                                        I 0000
      COMMON   T(9),ERRHI,X(9,4),M(11,9),MF(6),L(9),U(9),V(9),TF,SIG,MU         I 0010
      COMMON    FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                               I 0020
      COMMON   IO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)        I 0030
      COMMON   LFO,VFO,TFO                                                      I 0040
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)           I 0050
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSO(9),KB(9),KAY(9,4),AK(4,4)           I 0060
      COMMON   A(9,4),TIME,DELT,MTIME,LF,VF,FEED                                I 0070
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                                  I 0080
      COMMON   NIC,NIW                                                          I 0090
      REAL     LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                    I 0100
      REAL     LFO                                                              I 0110
  285 FORMAT   (2H  ,/,E33.6,2E19.6)                                            I 0120
      WRITE   (NIW,285)   FEED,L(JR),D                                          I 0130
      DO  72  J=1,JT                                                            I 0140
      SUM(J) = 0.0                                                              I 0150
      DO  72  I=1,LC                                                            I 0160
      SUM(J) = SUM(J) + X(J,I)                                                  I 0170
   72 CONTINUE                                                                  I 0180
  286 FORMAT   (16H0PLATE VARIABLES)                                            I 0190
      WRITE   (NIW,286)                                                         I 0200
  287 FORMAT   (115H0       SUMMATIONS          TEMPERATURES        VAPOR F    I 0210
     1LOWS          LIQUID FLOWS     VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,   I 0220
     2 (6E19.8))                                                                I 0230
      WRITE   (NIW,287)  (SUM(J) ,T(J),V(J),L(J),M(6,J),M(7,J),J=2,JR)          I 0240
      RDUTY = CDUTY + L(JR)*M(7,JR) + D*M(6,2) - MF(5)                          I 0250
  288 FORMAT   (18H0CONDENSER LOAD = ,E15.8,/,17H0REBOILER LOAD = ,E15.8        I 0260
     1,/,7H0PHI = ,E15.8)                                                       I 0270
      WRITE   (NIW,288)  CDUTY,RDUTY                                           I 0280
C                                                                               I 0290
      RETURN                                                                    I 0300
      END                                                                       I 0310
C                                                                               I 0320
```

```
      SUBROUTINE   ENTHAL                                                    J 0000
      COMMON    T(9),EKPH1,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU     J 0010
      COMMON     FAC,D,CDUTY,CDUTYD,CXF(4),CXFD(4)                           J 0020
      COMMON    TD(9),SUM(9),AL(4,4),AV(4,4),ZD(9,4),Y(9,4),YFD(4),XFD(4)   J 0030
      COMMON    LFD,VFD,TFD                                                  J 0040
      COMMON    SVD(9,4),VD(9),YD(9,4),SUD(9,4),UD(9),XD(9,4),SLD(9,4)       J 0050
      COMMON    LD(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)       J 0060
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED                           J 0070
      COMMON    ITER,LC,JT,JK,JL,JF,ISS,NOV(10)                              J 0080
      COMMON    NIC,NIM                                                      J 0090
      REAL      LD,KB,KAY,LF,K1,K2,K3,K4,L,MU                                J 0100
      REAL      LFD                                                          J 0110
      DO  39  K=1,10                                                         J 0120
      DO  39  J=1,JT                                                         J 0130
      H(K,J) = 0.0                                                           J 0140
   39 CONTINUE                                                               J 0150
C                                                                            J 0160
      DO  40  K=1,6                                                          J 0170
       HF(K) = 0.0                                                           J 0180
   40 CONTINUE                                                               J 0190
      HF51 = 0.0                                                             J 0200
      HF52 = 0.0                                                             J 0210
      HF61 = 0.0                                                             J 0220
      HF62 = 0.0                                                             J 0230
C                                                                            J 0240
      DO  43  I=1,LC                                                         J 0250
      QE = THALP(AV,T(JF),I)                                                 J 0260
      QF = THALP(AV,TF,I)                                                    J 0270
      QG = THALP(AL,TF,I)                                                    J 0280
      QH = THALP(AV,TFD,I)                                                   J 0290
      QI = THALP(AL,TFD,I)                                                   J 0300
C                                                                            J 0310
      HS1 = Z(JF-1,I)*QF                                                     J 0320
      HS2 = Z(JF,I)*QG                                                       J 0330
      HS01 = ZD(JF-1,I)*QH                                                   J 0340
      HS02 = ZD(JF,I)*QI                                                     J 0350
C                                                                            J 0360
      HF(1) = HF(1) + QE*YF(I)                                               J 0370
      HF(2) = HF(2) + QE*YFD(I)                                              J 0380
      HF(3) = HF(3) + QF*YF(I)                                               J 0390
      HF(4) = HF(4) + QH*YFD(I)                                              J 0400
      HF51 = HF51 + HS1                                                      J 0410
      HF52 = HF52 + HS2                                                      J 0420
      HF61 = HF61 + HS01                                                     J 0430
      HF62 = HF62 + HS02                                                     J 0440
   43 CONTINUE                                                               J 0450
      HF(5) = (HF51*VF + HF52*LF)/FEED/FEED                                  J 0460
      HF(6) = (HF61*VFD + HF62*LFD)/FEED/FEED                                J 0470
C                                                                            J 0480
      RETURN                                                                 J 0490
      END                                                                    J 0500
C                                                                            J 0510
```

```
      SUBROUTINE   ENTHA2                                                    K 0000
      COMMON    I(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),IF,SIG,MU     K 0010
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                           K 0020
      COMMON    IO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)    K 0030
      COMMON    LFO,VFO,IFO                                                  K 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)       K 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSO(9),KB(9),KAY(9,4),AK(4,4)       K 0060
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED                           K 0070
      COMMON    ITER,LC,JI,JK,JL,JF,ISS,NOV(10)                              K 0080
      COMMON    NIC,NIW                                                      K 0090
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                K 0100
      REAL      LFO                                                          K 0110
      DO   43   I=1,LC                                                       K 0120
      DO   42   M=1,JK                                                       K 0130
      J = M+1                                                                K 0140
      QA = THALP(AV,I(J),I)                                                  K 0150
      QB = THALP(AV,IO(J),I)                                                 K 0160
      QC = THALP(AL,I(M),I)                                                  K 0170
      QD = THALP(AL,IO(M),I)                                                 K 0180
C                                                                            K 0190
      H(1,J) = H(1,J) + QA* X(M,I)                                           K 0200
      H(2,J) = H(2,J) + QA* XO(M,I)                                          K 0210
      H(3,J) = H(3,J) + QA* X(2,I)                                           K 0220
      H(4,J) = H(4,J) + QA* XO(2,I)                                          K 0230
      H(5,J) = H(5,J) + QA* YO(J,I)                                          K 0240
      H(6,J) = H(6,J) + QB* YO(J,I)                                          K 0250
      H(7,M) = H(7,M) + QC* X(M,I)                                           K 0260
      H(8,M) = H(8,M) + QD* XO(M,I)                                          K 0270
      IF (J-JF)  42,42,41                                                    K 0280
   41 H(9,J) = H(9,J) + QA*CXF(I)                                            K 0290
      H(10,J) = H(10,J) + QA*CXFO(I)                                         K 0300
   42 CONTINUE                                                               K 0310
   43 CONTINUE                                                               K 0320
C                                                                            K 0330
      RETURN                                                                 K 0340
      END                                                                    K 0350
C                                                                            K 0360
```

```
      SUBROUTINE   LCORR                                                    L 0000
      COMMON    T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU    L 0010
      COMMON     FAC,D,CDUTY,CDUTY0,CAF(4),CAF0(4)                          L 0020
      COMMON    T0(9),SUM(9),AL(4,4),AV(4,4),Z0(9,4),Y(9,4),YF0(4),XF0(4)  L 0030
      COMMON    LF0,VF0,TF0                                                L 0040
      COMMON    SV0(9,4),V0(9),Y0(9,4),SU0(9,4),U0(9),X0(9,4),SL0(9,4)     L 0050
      COMMON    L0(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)     L 0060
      COMMON    A(9,4),TIME,DELT,HTIME,LF,VF,FEED                          L 0070
      COMMON    ITER,LC,JT,JK,JL,JF,IS5,NOV(10)                            L 0080
      COMMON    NIC,NIW                                                    L 0090
      REAL      L0,KB,KAY,LF,K1,K2,K3,K4,L,MU                              L 0100
      REAL      LF0                                                        L 0110
      CDUTY =  (L(2)+D)*(H(1,3)-H(7,2))+SIG*((L0(2)+D)*(H(2,3)-H(8,2))-    L 0120
     1      V0(3)*(H(5,3)-H(6,3))-CDUTY0) + (U(2)*(H(1,3)-H(7,2)) -        L 0130
     2      U0(2)*(H(2,3)-H(8,2)))/FAC                                     L 0140
C                                                                           L 0150
      SH1= VF*(HF(1) - HF(3)) + SIG*VF0*(HF(2)-HF(4))                       L 0160
C                                                                           L 0170
       DO  490  J=3,JL                                                      L 0180
      M = J+1                                                               L 0190
      IF (M-JF)  44,45,46                                                   L 0200
   44 SH = 0.0                                                              L 0210
       GO TO 47                                                             L 0220
   45 SH = SH1                                                              L 0230
      GO TO 47                                                              L 0240
   46 SH = FEED*(H(9,M)-HF(5)) + SIG*FEED*(H(10,M)-HF(6))                   L 0250
   47 CONTINUE                                                              L 0260
      HSUM = 0.0                                                            L 0270
      DO  49  K=2,J                                                         L 0280
      HS = 0.0                                                              L 0290
      HS0 = 0.0                                                             L 0300
      DO  480  I=1,LC                                                       L 0310
      HS = HS + THALP(AV,T(M),I)* X(K,I)                                    L 0320
      HS0 = HS0 + THALP(AV, T(M),I)* X0(K,I)                                L 0330
  480 CONTINUE                                                              L 0340
      HSUM = HSUM + U(K)*(HS-H(7,K)) - U0(K)*(HS0-H(8,K))                   L 0350
   49 CONTINUE                                                              L 0360
C                                                                           L 0370
      H0 = H(1,M) - H(7,J)                                                  L 0380
      L(J) = (-D*(H(3,M)-H(7,2))+CDUTY+SIG*(V0(M)*(H(5,M)-H(6,M)) -         L 0390
     1         L0(J)*(H(2,M)-H(8,J)) - D*(H(4,M)-H(6,2)) + CDUTY0)) / H0    L 0400
     2         - HSUM/FAC/H0 + SH/H0                                        L 0410
C                                                                           L 0420
  490 CONTINUE                                                              L 0430
C                                                                           L 0440
      RETURN                                                                L 0450
      END                                                                   L 0460
C                                                                           L 0470
```



```
      SUBROUTINE   LCORR2                                                    M 0000
      COMMON    T(9),ERPMI,X(9,4),M(11,9),MF(6),L(9),U(9),V(9),TF,SIG,MU     M 0010
      COMMON     FAC,D,CDOTY,CDOTYO,CXF(4),CXFO(4)                           M 0020
      COMMON    TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)    M 0030
      COMMON    LFO,VFO,TFO                                                  M 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)       M 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)       M 0060
      COMMON    A(9,4),TIME,DELT,MITIME,LF,VF,FEED                           M 0070
      COMMON    ITER,LC,JT,JK,JL,JF,ISS,NOV(10)                              M 0080
      COMMON    NIC,NIW                                                      M 0090
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                M 0100
      REAL      LFO                                                          M 0110
      USUM = 0.0                                                             M 0120
      DO  50  J=2,JK                                                         M 0130
      USUM = USUM + (U(J)-UO(J))                                             M 0140
   50 CONTINUE                                                               M 0150
      L(JK) = (FEED-D) + SIG*(FEED-D-LO(JK)) - USUM/FAC                      M 0160
C                                                                            M 0170
      MM = JL-1                                                              M 0180
      DO  56  J=3,MM                                                         M 0190
      M = J+1                                                                M 0200
      USUM = 0.0                                                             M 0210
      DO  51  K=2,J                                                          M 0220
      USUM = USUM  + (U(K) - UO(K))                                          M 0230
   51 CONTINUE                                                               M 0240
C                                                                            M 0250
      IF (M-JF) 52,53,54                                                     M 0260
   52 Z1 = 0.0                                                               M 0270
      GO TO 55                                                               M 0280
   53 Z1 = VF                                                                M 0290
      GO TO 55                                                               M 0300
   54 Z1 = FEED                                                              M 0310
   55 CONTINUE                                                               M 0320
      V(M) = L(J) + D - Z1 - SIG*(VO(M)+Z1-LO(J)-D) + USUM/FAC               M 0330
   56 CONTINUE                                                               M 0340
C                                                                            M 0350
      V(JK) = L(JL)-L(JK)+SIG*(LO(JL)-LO(JK)-VO(JK))-(U(JK)-UO(JK))/FAC      M 0360
C                                                                            M 0370
      RETURN                                                                 M 0380
      END                                                                    M 0390
```



```
13.04.16.  NORMAL                    CONTROL                                                    000100
--TIME---LOAD MODE --L1--L2-----TYPE---------------USER---++---CALL-------------FWA LOA
A LOADER  064267  FWA TABLES  063060
PROGRAM-----ADDRESS-                          --LABELED---COMMON--
LER         000100
OILR        004540
HALP        004617
JBPT        004660
ATAD        005126
OUT1        005555
OUT2        006072
NCE         006324
ITE1        006515
ITE2        007141
NTHAL       007340
NTHA2       007546
CORR        007765
CORR2       010275
YSTEM       010454                                SCOPE2       010454
ECOND       011431
UTPTC       011455
NPUTC       013007
IOS         014106
LIBA        014735
---UNSATISFIED EXTERNALS-----                                 REFERENCES

KOM START  =      5.471
```

cm 1 2 3 4 5 6 7 8 unesp 12 13 14 15 16 17 18

BG - Listagem do Programa para o Método de Runge-Kutta, utilizado para o Exemplo III.2.B

```
      PROGRAM  RUNGE  (INPUT,OUTPUT,TAPE10=INPUT,TAPE5=OUTPUT)                A 0000
      COMMON   T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU      A 0010
      COMMON    FAC,D,COUTY,COUTY0,CXF(4),CYF0(4)                            A 0020
      COMMON  T0(9),SUM(9),AL(4,4),AV(4,4),Y0(9,4), Y(9,4),YF0(4),XF0(4)     A 0030
      COMMON   LF0,VF0,TF0                                                   A 0040
      COMMON   SV0(9,4),V0(9),Y0(9,4),SU0(9,4),U0(9),X0(9,4),SL0(9,4)        A 0050
      COMMON   L0(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)        A 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                            A 0070
      COMMON   ITER,LC,JT,JR,JL,JF,ISS,NOV(10)                               A 0080
      COMMON   NIC,NIW                                                       A 0090
      DIMENSION   S(9,4)                                                     A 0100
      REAL     L0,KB,KAY,LF,K1,K2,K3,K4,L,MU                                 A 0110
      REAL     LF0                                                           A 0120
      DIMENSION F1(9,4),F2(9),F3(9)                                          A 0130
      DIMENSION   K1(9,4),K2(9,4),K3(9,4)                                    A 0140
      NIW = 5                                                                A 0150
      NIC = 10                                                               A 0160
      K1 = 1                                                                 A 0170
      K0 = 1                                                                 A 0180
      CALL SECOND(TTM)                                                       A 0190
      PRINT  789,  TTM                                                       A 0200
      CALL SECOND(TTM)                                                       A 0210
      PRINT  789,  TTM                                                       A 0220
  789 FORMAT  (* TIME IN COMPUTER = *, F8.3, *  SECONDS *)                   A 0230
 6000 CONTINUE                                                               A 0240
      CALL OVRLAY (NOV(01))                                                  A 0250
      CALL DATAD(ISS)                                                        A 0260
      CALL OVRLAY (NOV(02))                                                  A 0270
      CALL DOUT1                                                             A 0280
      CALL OVRLAY (NOV(03))                                                  A 0290
      CALL DOUT2                                                             A 0300
      CALL OVRLAY (NOV(04))                                                  A 0310
      CALL ONCE (S)                                                          A 0320
      DELT = DELT/FLOAT(KI)                                                  A 0330
      FAC = MU*DELT                                                          A 0340
 6060 FORMAT   (21H1FOR THIS RUN DELT =  ,F20.4,1H1)                         A 0350
      WRITE   (NIW,6060) DELT                                                A 0360
      TIME = 0.0                                                             A 0370
      K = 0                                                                  A 0380
 1000 CONTINUE                                                               A 0390
      TIME = TIME + DELT                                                     A 0400
      CALL SECOND(TTM)                                                       A 0410
      PRINT  789,  TTM                                                       A 0420
C                                                                            A 0430
      DO  10  J=2,JR                                                         A 0440
      DO  9  I=1,LC                                                          A 0450
      F1(J,I) = L0(J+1) * S(J+1,I) / U0(J+1)                                 A 0460
    9 CONTINUE                                                               A 0470
      F2(J) = L0(J-1)/U0(J-1)                                                A 0480
      F3(J) = L0(J)/U0(J)                                                    A 0490
C                                                                            A 0500
   10 CONTINUE                                                               A 0510
      DO  12  I=1,LC                                                         A 0520
      DO  11 J=2,JR                                                          A 0530
      K1(J,I) = DELT*(Z(J,I) + F1(J,I)*SU0(J+1,I) + F2(J)*SU0(J-1,I) -       A 0540
     1   F3(J) * (S(J,I) + 1.0)*SU0(J,I))                                    A 0550
   11 CONTINUE                                                               A 0560
      K1(JT,I) = 0.0                                                         A 0570
      K1(1,I) = 0.0                                                          A 0580
   12 CONTINUE                                                               A 0590
C                                                                            A 0600
      DO  14  I=1,LC                                                         A 0610
```

```
      DO  13  J=2,JR                                                    B99   A 0620
      K2(J,I) = DELT*(Z(J,I) + F1(J,I)*(SUO(J+1,I)+K1(J+1,I)/2.0) + F2(J    A 0630
     1)*(SUO(J-1,I) + K1(J-1,I)/2.0) - F3(J)*(SUO(J,I)+K1(J,I)/2.0)*(S(J   A 0640
     2,I)+1.0))                                                             A 0650
   13 CONTINUE                                                              A 0660
      K2(JT,I) = 0.0                                                        A 0670
      K2(1,I) = 0.0                                                         A 0680
   14 CONTINUE                                                              A 0690
      DO  16  I=1,LC                                                        A 0700
      DO  15  J=2,JR                                                        A 0710
      K3(J,I) =DELT*(Z(J,I) + F1(J,I) *(SUO(J+1,I)+K2(J+1,I)/2.0) + F2(J    A 0720
     1)*(SUO(J-1,I)+K2(J-1,I)/2.0) - F3(J)*(SUO(J,I)+K2(J,I)/2.0)*(S(J,I   A 0730
     2)+1.0))                                                               A 0740
   15 CONTINUE                                                              A 0750
      K3(JT,I) = 0.0                                                        A 0760
      K3(1,I) = 0.0                                                         A 0770
   16 CONTINUE                                                              A 0780
      DO  18  I=1,LC                                                        A 0790
      DO  18  J=2,JR                                                        A 0800
      K4      =DELT*(Z(J,I) + F1(J,I) *(SUO(J+1,I)+K3(J+1,I)     ) + F2(J   A 0810
     1)*(SUO(J-1,I)+K3(J-1,I)     ) - F3(J)*(SUO(J,I)+K3(J,I)     )*(S(J,I   A 0820
     2)+1.0))                                                               A 0830
      SUO(J,I) = SUO(J,I) + (K1(J,I) + 2.0*(K2(J,I)+K3(J,I)) + K4)/6.0      A 0840
   18 CONTINUE                                                              A 0850
      DO  36  J=2,JR                                                        A 0860
      SSU(J) =0.0                                                           A 0870
      DO  36  I=1,LC                                                        A 0880
      SSU(J) = SSU(J) + SUO(J,I)                                            A 0890
   36 CONTINUE                                                              A 0900
      DO  38  J=2,JR                                                        A 0910
      DO  37  I=1,LC                                                        A 0920
      X(J,I) = SUO(J,I)/SSU(J)                                              A 0930
   37 CONTINUE                                                              A 0940
      CALL BUBPT(X,J,TO(J),AK,LC,T(J),ERPHI)                                A 0950
   38 CONTINUE                                                              A 0960
      CALL OVRLAY  (NOV(07))                                                A 0970
      CALL ENTHAL                                                           A 0980
      CALL OVRLAY (NOV(08))                                                 A 0990
      CALL ENTHA2                                                           A 1000
      CALL OVRLAY (NOV(09))                                                 A 1010
      CALL LCORR                                                            A 1020
      CALL OVRLAY (NOV(10))                                                 A 1030
      CALL LCORR2                                                           A 1040
      DO  339  J=2,JR                                                       A 1050
      DO  338  I=1,LC                                                       A 1060
      XO(J,I) = X(J,I)                                                      A 1070
      YO(J,I) = EQUILK(AK,I,T(J))*XO(J,I)                                   A 1080
      S(J,I) = V(J)*YO(J,I)/L(J)/X(J,I)                                     A 1090
  338 CONTINUE                                                              A 1100
      TO(J) = T(J)                                                          A 1110
      LO(J) = L(J)                                                          A 1120
      VO(J) = V(J)                                                          A 1130
      UO(J) = U(J)                                                          A 1140
  339 CONTINUE                                                              A 1150
      DO  40  J=2,JR                                                        A 1160
      DO  40  I=1,LC                                                        A 1170
      SVO(J,I) = VO(J) * YO(J,I)                                            A 1180
      SLO(J,I) = LO(J) * XO(J,I)                                            A 1190
   40 CONTINUE                                                              A 1200
      DO  440  I=1,LC                                                       A 1210
      SVO(2,I) = VO(2)*XO(2,I)                                              A 1220
      S(2,I) = D/LO(2)                                                      A 1230
      ZO(JF-1,I) = Z(JF-1,I)                                                A 1240
      ZO(JF,I) = Z(JF,I)                                                    A 1250
      CXFO(I) = CXF(I)                                                      A 1260
      XFO(I) = XF(I)                                                        A 1270
```



```
      XFO(I) = XF(I)                                                    B100
      YFO(I) = YF(I)
  440 CONTINUE
      TFO = TF
      LFO = LF
      VFO = VF
      K = K+1
      IF (K-K/KI*KI)  1000,2000,1000
 2000 CONTINUE
      CALL OVRLAY (NOV(05))
      CALL RITE1
      CALL OVRLAY (NOV(06))
      CALL RITE2
      IF (TIME-HITIME)  1000,3000,3000
 3000 CONTINUE
      IF (KO-3)  4000,4000,5000
 4000 CONTINUE
      KO = KO + 1
      KI = KI*2
      GO TO 6000
 5000 CONTINUE
      CALL EXIT
      END
      SUBROUTINE  OVRLAY(I)
      RETURN
      END
      FUNCTION  EQUILK(A,I,Q)
      DIMENSION  A(4,4)
      T = Q+459.69
      Z = ((A(4,I)*T+A(3,I))*T+A(2,I))*T+A(1,I)
      EQUILK = Z*Z*Z*T
      RETURN
      END
C
      FUNCTION  THALP(A,Q,I)
      DIMENSION A(4,4)
      T = Q+459.69
      Z = (A(3,I)*T+A(2,I))*T+A(1,I)
      THALP = Z*Z
      RETURN
      END
C
      SUBROUTINE  BUBPT(X,I,TT,A,L,T,BPERR)
      DIMENSION  X(9,4),A(4,4)
C
C     SUBROUTINE FOR CALCULATING BUBBLE POINTS
C
C
      NTW = 5
      KTIMES = 1
      IBP = -1
      T = TT
    3 SUMY = 0.0
      IBP = IBP + 1
      DO  4  I=1,L
      Y = EQUILK(A,I,T)*X(J,I)
      SUMY = SUMY + Y
    4 CONTINUE
      IF (ABS(SUMY-1.0)-BPERR)  8,8,5
    5 KTIMES = KTIMES - 1
      IF (KTIMES)  7,6,6
    6 SUMYO = SUMY
      TO = T
      T = T + 10.0
      GO TO 3
    7 CONTINUE
      IF (T-TO)  10,11,10
   10 CONTINUE
```

```
A 1280
A 1290
A 1300
A 1310
A 1320
A 1330
A 1340
A 1350
A 1360
A 1370
A 1380
A 1390
A 1400
A 1410
A 1420
A 1430
A 1440
A 1450
A 1460
A 1470
A 1480
A 1490
B 0000
B 0010
B 0020
C 0000
C 0010
C 0020
C 0030
C 0040
C 0050
C 0060
C 0070
C 0080
C 0090
C 0100
C 0110
C 0120
C 0130
C 0140
C 0150
D 0000
D 0010
D 0020
D 0030
D 0040
D 0050
D 0060
D 0070
D 0080
D 0090
D 0100
D 0110
D 0120
D 0130
D 0140
D 0150
D 0160
D 0170
D 0180
D 0190
D 0200
D 0210
D 0220
D 0230
D 0240
```

```
      SLOPE = (SUMY-SUMYO)/(T-TO)                                       D 0250
      IF (SLOPE)  12,11,12                                        B101  D 0260
   12 CONTINUE                                                          D 0270
      TN = ((1.0-SUMY) / SLOPE) + T                                     D 0280
      SUMYO = SUMY                                                      D 0290
      TO = T                                                            D 0300
      T = TN                                                            D 0310
      GO TO 3                                                           D 0320
    8 CONTINUE                                                          D 0330
      WRITE   (NIW,101)   IBP                                           D 0340
  101 FORMAT   (110X,3HBP ,I4)                                          D 0350
      RETURN                                                            D 0360
   11 CONTINUE                                                          D 0370
      ZTLCH = 1.0-SUMY                                                  D 0380
      WRITE   (NIW,102)   SUMY,SUMYO,T,TO,SLOPE,ZTLCH,BPERR,IBP         D 0390
  102 FORMAT   (1H0,30(1H*),//,43H WARNING, ZERO DENOMINATOR IN BUBBLE P D 0400
     1OINT   ,//,20H SUM OF Y            = , 0PE20.9,/,                 D 0410
     3  20H OLD SUM OF Y      = , E20.9,/, 20H TEMPERATURE (F)  = ,      D 0420
     6  E20.9,/,    20H OLD TEMP    (F)    = ,  E20.9,/,                D 0430
     7  20H SLOPE             = , E20.9,/,                              D 0440
     9  20H 1.0 - SUM OF Y    = , E20.9,/,                              D 0450
     1  20H ERROR LIMIT       = , E20.9,/,                              D 0460
     2  20H NO OF ITERATIONS = ,  I5,// 90(1H*),//)                     D 0470
      RETURN                                                            D 0480
      END                                                               D 0490
C                                                                       D 0500
      SUBROUTINE   DATAD(IO)                                            E 0000
      COMMON   T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU  E 0010
      COMMON    FAC,D,CDUTY,CDUTYO,CXF(4),CYFO(4)                       E 0020
      COMMON   TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4) E 0030
      COMMON   LFO,VFO,TFO                                              E 0040
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)   E 0050
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)   E 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                       E 0070
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                          E 0080
      COMMON   NIC,NIW                                                  E 0090
      REAL     LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                            E 0100
      REAL     LFO                                                      E 0110
      READ    (NIC,201)   LC,NT,NF,IREF,IS5                             E 0120
      IO = IS5                                                          E 0130
      READ    (NIC,202)   ((AK(K,I),K=1,4),I=1,LC)                      E 0140
      READ    (NIC,202)   ((AL(K,I),K=1,4),I=1,LC)                      E 0150
      READ    (NIC,202)   ((AV(K,I),K=1,4),I=1,LC)                      E 0160
      JC = 2                                                            E 0170
      JF = NF+2                                                         E 0180
      JL = NT+2                                                         E 0190
      JR = NT+3                                                         E 0200
      JT = NT+4                                                         E 0210
      READ   (NIC,202)   (TO(J),J=1,JT)                                 E 0220
      READ   (NIC,202)   (VO(J),J=1,JT)                                 E 0230
      READ   (NIC,202)   (LO(J),J=1,JT)                                 E 0240
      READ   (NIC,202)   (UO(J),J=1,JT)                                 E 0250
      READ   (NIC,202)   TFO,LFO,VFO                                    E 0260
      READ   (NIC,202)   TF, LF, VF                                     E 0270
      READ    (NIC,202)   D                                             E 0280
      READ    (NIC,202)   MU, DELT, ERPHI, HITIME                       E 0290
      READ    (NIC,202)   TCONA, TCONB, CDUTYO, ERBUB                   E 0300
C                                                                       E 0310
      DO  1  J=1,JT                                                     E 0320
      READ    (NIC,203)   (XO(J,I),I=1,LC)                              E 0330
      READ    (NIC,203)   (YO(J,I),I=1,LC)                              E 0340
    1 CONTINUE                                                          E 0350
      READ   (NIC,203)   (XFO(I),I=1,LC)                                E 0360
      READ   (NIC,203)   (YFO(I),I=1,LC)                                E 0370
      READ    (NIC,203)   (XF(I),I=1,LC)                                E 0380
      READ    (NIC,203)   (YF(I),I=1,LC)                                E 0390
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      READ      (NIC,203)    (TF(I),I=1,LC)                                  E 0390
C                                                                             E 0400
C     READ      (NIC,203)    (KB(J),J=1,JT)                          B102    E 0410
C                                                                             E 0420
  201 FORMAT    (10I5)                                                        E 0430
  202 FORMAT    (4E20.8)                                                      E 0440
  203 FORMAT    (8F10.0)                                                      E 0450
C                                                                             E 0460
      RETURN                                                                  E 0470
      END                                                                     E 0480
C                                                                             E 0490
      SUBROUTINE   DOUT1                                                      F 0000
      COMMON    T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU      F 0010
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CYFO(4)                            F 0020
      COMMON    TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)    F 0030
      COMMON    LFO,VFO,TFO                                                   F 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)        F 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)        F 0060
      COMMON    A(9,4),TIME,DELT,HITIME,LF,VF,FEED                            F 0070
      COMMON    ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                               F 0080
      COMMON    NIC,NIW                                                       F 0090
      REAL      LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                 F 0100
      REAL      LFO                                                           F 0110
      DO   626  I=1,LC                                                        F 0120
      X(1,I) = XF(I)                                                          F 0130
      X(9,I) = XFO(I)                                                         F 0140
  626 CONTINUE                                                                F 0150
      CALL BUBPT (X,1,TO(JF),AK,LC,TF,ERPHI)                                  F 0160
      CALL BUBPT(X,9,TO(JF),AK,LC,TFO,ERPHI)                                  F 0170
      DO  627  J=3,JR                                                         F 0180
      DO  627  I=1,LC                                                         F 0190
      YO(J,I) = EQUILK(AK,I,TO(J))*XO(J,I)                                    F 0200
  627 CONTINUE                                                                F 0210
      DO  628  I=1,LC                                                         F 0220
      YO(2,I) = XO(2,I)                                                       F 0230
  628 CONTINUE                                                                F 0240
  205 FORMAT  (57H1INPUT DATA     DYNAMIC DISTILLATION     HOLLANDS METH      F 0250
     1OD )                                                                    F 0260
      WRITE   (NIW,205)                                                       F 0270
  206 FORMAT   (86HONO. OF COMPONENTS     STRIPPING PLATES     RECTIFYING     F 0280
     1 PLATES     REFERENCE COMPONENT  ,/,(T10,I22,I21,I22))                  F 0290
      MFOW = JL - JF                                                          F 0300
      MOO = JF - 2                                                            F 0310
      WRITE   (NIW,206)   LC,MFOW,MOO                                         F 0320
  207 FORMAT   (20HOLIQUID FEED RATE =  ,0PE17.8, 5X,18HVAPOR FEED RATE      F 0330
     1=  ,E17.8, 5X,19HFEED TEMPERATURE =  ,E17.8)                            F 0340
      WRITE   (NIW,207)   LF,VF,TF                                            F 0350
  208 FORMAT   (70HOLIQUID FEED COMPOSITION      VAPOR FEED COMPOSITION       F 0360
     1     BY COMPONENT  ,/, (0PE20.8,E28.8,I16))                            F 0370
      WRITE   (NIW,208)   (XF(I),YF(I),I,I=1,LC)                              F 0380
  209 FORMAT   (79HOTRAY      TEMPERATURE      VAPOR FLOW RATE      LIQU      F 0390
     1ID FLOW RATE      HOLD UP  ,/,(I4,0PE20.6,E19.8,E22.8,E22.8))          F 0400
      DO  222  J=1,JT                                                         F 0410
      MIX = J-2                                                               F 0420
      WRITE   (NIW,209)    MIX,TO(J),VO(J),LO(J),UO(J)                        F 0430
  222 CONTINUE                                                                F 0440
C                                                                             F 0450
      RETURN                                                                  F 0460
      END                                                                     F 0470
C                                                                             F 0480
      SUBROUTINE   DOUT2                                                      G 0000
      COMMON    T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU      G 0010
      COMMON     FAC,D,CDUTY,CDUTYO,CXF(4),CYFO(4)                            G 0020
      COMMON    TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)    G 0030
      COMMON    LFO,VFO,TFO                                                   G 0040
      COMMON    SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)        G 0050
      COMMON    LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)        G 0060
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      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)   G 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                       G 0070
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                  B103    G 0080
      COMMON   NIC,NIW                                                  G 0090
      REAL     LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                            G 0100
      REAL     LFO                                                      G 0110
  210 FORMAT   (13H0COMPOSITIONS ,/,17X,2HC1,24X,2HC2,24X,2HC3,24X,2HC4,  G 0120
     1 /,5H TRAY,4(6X,6HLIQUID,6X,5HVAPOR,2X),/,(I4,3X,F12.8,F12.8,F14.8  G 0130
     2,F12.8,F14.8,F12.8,F14.8,F12.8))                                  G 0140
      DO  211  J=1,JT                                                   G 0150
      MIX = J-2                                                         G 0160
      WRITE    (NIW,210)    MIX,(XO(J,I),YO(J,I),I=1,LC)                G 0170
  211 CONTINUE                                                          G 0180
  212 FORMAT   (22H0EQUILIBRIUM CONSTANTS,5X,5HCOMP.,12X,2HA1,15X,2HA2,1  G 0190
     15X,2HA3,15X,2HA4,/,(2X,I3,7X,0P4E17.8))                           G 0200
      WRITE    (NIW,212)    (I,(AK(K,I),K=1,4),I=1,LC)                  G 0210
  213 FORMAT   (26H0LIQUID ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HC1,15X,2  G 0220
     1HC2,15X,2HC3,15X,2HC4,/,(3X,I3,7X,0PE17.8))                       G 0230
      WRITE    (NIW,213)    (I,(AL(K,I),K=1,4),I=1,LC)                  G 0240
  214 FORMAT   (26H0 VAPOR ENTHALPY CONSTANTS ,5X,5HCOMP.,12X,2HE1,15X,2  G 0250
     1HE2,15X,2HE3,15X,2HE4,/,(3X,I3,0P4E17.8))                         G 0260
      WRITE    (NIW,214)    (I,(AV(K,I),K=1,4),I=1,LC)                  G 0270
  215 FORMAT   (13H0 KB BY TRAY  ,/,(F13.8))                            G 0280
C     WRITE    (NIW,215)    (KB(J),J=1,JT)                              G 0290
C                                                                       G 0300
      RETURN                                                            G 0310
      END                                                               G 0320
C                                                                       G 0330
      SUBROUTINE  ONCE(S)                                               H 0000
      COMMON   T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU  H 0010
      COMMON    FAC,D,COUTY,COUTYO,CXF(4),CYF0(4)                       H 0020
      COMMON   TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)  H 0030
      COMMON   LFO,VFO,TFO                                              H 0040
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)   H 0050
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)   H 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                       H 0070
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                          H 0080
      COMMON   NIC,NIW                                                  H 0090
      DIMENSION   S(9,4)                                                H 0100
      REAL     LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                            H 0110
      REAL     LFO                                                      H 0120
      FEED = LF + VF                                                    H 0130
      SIG  = (1.0-MU)/MU                                                H 0140
      DO  6  I=1,LC                                                     H 0150
      DO  5  J=1,JT                                                     H 0160
      SVO(J,I) = VO(J) * YO(J,I)                                        H 0170
      SUO(J,I) = UO(J) * XO(J,I)                                        H 0180
      SLO(J,I) = LO(J) * XO(J,I)                                        H 0190
      S(J,I) = VO(J)*EQUILK(AK,I,TO(J))/LO(J)                           H 0200
    5 CONTINUE                                                          H 0210
      SLO(1,I) = 0.0                                                    H 0220
      SVO(JT,I) = 0.0                                                   H 0230
      S(JT,I) = 0.0                                                     H 0240
      S(2,I) = D/LO(2)                                                  H 0250
      S(1,I) = 0.0                                                      H 0260
      SUO(JT,I) = 0.0                                                   H 0270
      SUO(1,I) = 0.0                                                    H 0280
    6 CONTINUE                                                          H 0290
C                                                                       H 0300
C                                                                       H 0310
      DO  3  J=1,JT                                                     H 0320
      DO  3  I=1,LC                                                     H 0330
      Z(J,I) = 0.0                                                      H 0340
      ZO(J,I) = 0.0                                                     H 0350
    3 CONTINUE                                                          H 0360
C                                                                       H 0370
      DO  4  I=1,LC                                                     H 0380
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      DO 4 I=1,LC                                                        H 0380
      Z(JF-1) = YF(I) * VF                                               H 0390
      Z(JF,I) = XF(I) * LF                                        B104   H 0400
      ZO(JF-1,I) = YFO(I)*VFO                                            H 0410
      ZO(JF,I) = XFO(I)*LFO                                              H 0420
      CXFO(I) = (ZO(JF-1,I) + ZO(JF,I))/FEED                             H 0430
      CXF(I) = (Z(JF-1,I) + Z(JF,I))/FEED                                H 0440
    4 CONTINUE                                                           H 0450
      LO(1) = 0.0                                                        H 0460
      LO(JT) = 0.0                                                       H 0470
      UO(JT) = 1.0                                                       H 0480
      UO(1) = 1.0                                                        H 0490
      V(2) = D                                                           H 0500
      L(2) = LO(2)                                                       H 0510
      V(3) = D + L(2)                                                    H 0520
      DO 7 J=1,JT                                                        H 0530
      U(J) = UO(J)                                                       H 0540
    7 CONTINUE                                                           H 0550
C                                                                        H 0560
      RETURN                                                             H 0570
      END                                                                H 0580
C                                                                        H 0590
      SUBROUTINE RITE1                                                   J 0000
      COMMON T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU    J 0010
      COMMON FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                           J 0020
      COMMON TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4)   J 0030
      COMMON LFO,VFO,TFO                                                 J 0040
      COMMON SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)      J 0050
      COMMON LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)      J 0060
      COMMON A(9,4),TIME,DELT,HITIME,LF,VF,FEED                          J 0070
      COMMON ITER,LC,JT,JR,JL,JF,ISS,NOV(10)                             J 0080
      COMMON NIC,NIW                                                     J 0090
      DIMENSION AS(4),BS(4),CS(4),DS(4),ES(4),FS(4)                      J 0100
      REAL LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                                 J 0110
      REAL LFO                                                           J 0120
  274 FORMAT (12H1PROBLEM NO.,/,8H TIME = ,F10.3,//,      53HOLIQUID M   J 0130
     1OLE FRACTIONS LISTED AS COMPONENTS PER PLATE)                      J 0140
      WRITE (NIW,274) TIME                                               J 0150
  276 FORMAT (21HO BOTTOM PRODUCT,/,(5E20.8))                            J 0160
      WRITE (NIW,276) (X(JR,I),I=1,LC)                                   J 0170
  277 FORMAT (19HO PLATE NO. = ,I3,/,(5E20.8))                           J 0180
      DO 71 K=3,JL                                                       J 0190
      JPLATE = K-2                                                       J 0200
      J = JL-K+3                                                         J 0210
      WRITE (NIW,277) JPLATE,(X(J,I),I=1,LC)                             J 0220
   71 CONTINUE                                                           J 0230
  279 FORMAT (13HO REFLUX, /,(5E20.8))                                   J 0240
      WRITE (NIW,279) (X(2,I),I=1,LC)                                    J 0250
  280 FORMAT (18HO TOP PRODUCT,/,(5E20.8))                               J 0260
      WRITE (NIW,280) (X(2,I),I=1,LC)                                    J 0270
  281 FORMAT (34HOBOTTOM PRODUCT RECOVERY FRACTIONS,/,(5E20.8))          J 0280
      DO 666 I=1,LC                                                      J 0290
      AS(I) = CXF(I) * FEED                                              J 0300
      BS(I) = L(JR)*X(JR,I)                                              J 0310
      CS(I) = D*X(2,I)                                                   J 0320
      DS(I) = BS(I)/AS(I)                                                J 0330
      ES(I) = CS(I)/AS(I)                                                J 0340
      FS(I) = DS(I) + ES(I)                                              J 0350
  666 CONTINUE                                                           J 0360
      WRITE (NIW,281) (DS(I),I=1,LC)                                     J 0370
  282 FORMAT (31HOTOP PRODUCT RECOVERY FRACTIONS,/,(5E20.8))             J 0380
      WRITE (NIW,282) (ES(I),I=1,LC)                                     J 0390
  292 FORMAT (62HOSUMS OF RECOVERY FRACTIONS. SHOULD EQUAL 1.0 AT STEA   J 0400
     1DY STATE ,/,(5E20.8),/)                                            J 0410
      WRITE (NIW,292) (FS(I),I=1,LC)                                     J 0420
  283 FORMAT (27HOMOLES OF FEED AND PRODUCTS)                            J 0430
      WRITE (NIW,283)                                                    J 0440
```



```
      WRITE  (NIW,     )
  284 FORMAT  (70H0      COMPONENT              FEED          BOTTOM PRODUCT    J 0450
     1      TOP PRODUCT,/,(I11,E22.8,2E19.8))                                  B105J 0460
      WRITE  (NIW,284)  (I,AS(I),BS(I),CS(I),I=1,LC)                           J 0470
C                                                                              J 0480
      RETURN                                                                   J 0490
      END                                                                      J 0500
C                                                                              J 0510
      SUBROUTINE  RITE2                                                        K 0000
      COMMON  T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU         K 0010
      COMMON   FAC,D,CDUTY,CDUTY0,CXF(4),CYF0(4)                               K 0020
      COMMON  T0(9),SUM(9),AL(4,4),AV(4,4),Z0(9,4),Y(9,4),YF0(4),XF0(4)        K 0030
      COMMON  LF0,VF0,TF0                                                      K 0040
      COMMON  SV0(9,4),V0(9),Y0(9,4),SU0(9,4),U0(9),X0(9,4),SL0(9,4)           K 0050
      COMMON  L0(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)           K 0060
      COMMON  A(9,4),TIME,DELT,HITIME,LF,VF,FEED                               K 0070
      COMMON  ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                                  K 0080
      COMMON  NIC,NIW                                                          K 0090
      REAL    L0,KB,KAY,LF,K1,K2,K3,K4,L,MU                                    K 0100
      REAL    LF0                                                              K 0110
  285 FORMAT  (2H  ,/,E33.8,2E19.8)                                            K 0120
      WRITE  (NIW,285)  FEED,L(JR),D                                           K 0130
      DO  72  J=1,JT                                                           K 0140
      SUM(J) = 0.0                                                             K 0150
      DO  72  I=1,LC                                                           K 0160
      SUM(J) = SUM(J) + X(J,I)                                                 K 0170
   72 CONTINUE                                                                 K 0180
  286 FORMAT  (16H0PLATE VARIABLES)                                            K 0190
      WRITE  (NIW,286)                                                         K 0200
  287 FORMAT  (115H0        SUMMATIONS          TEMPERATURES        VAPOR F    K 0210
     1LOWS          LIQUID FLOWS     VAP MOL ENTHALPY   LIQ MOL ENTHALPY,/,   K 0220
     2 (6E19.8))                                                               K 0230
      WRITE  (NIW,287)  (SUM(J) ,T(J),V(J),L(J),H(6,J),H(7,J),J=2,JR)          K 0240
      RDUTY = CDUTY + L(JR)*H(7,JR) + D*H(6,2) - HF(5)                         K 0250
  288 FORMAT  (18H0CONDENSER LOAD = ,E15.8,/,17H0REBOILER LOAD = ,E15.8        K 0260
     1,/,7H0PHI = ,E15.8)                                                      K 0270
      WRITE  (NIW,288)  CDUTY,RDUTY                                            K 0280
C                                                                              K 0290
      RETURN                                                                   K 0300
      END                                                                      K 0310
C                                                                              K 0320
      SUBROUTINE  ENTHAL                                                       L 0000
      COMMON  T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU         L 0010
      COMMON   FAC,D,CDUTY,CDUTY0,CXF(4),CYF0(4)                               L 0020
      COMMON  T0(9),SUM(9),AL(4,4),AV(4,4),Z0(9,4),Y(9,4),YF0(4),XF0(4)        L 0030
      COMMON  LF0,VF0,TF0                                                      L 0040
      COMMON  SV0(9,4),V0(9),Y0(9,4),SU0(9,4),U0(9),X0(9,4),SL0(9,4)           L 0050
      COMMON  L0(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)           L 0060
      COMMON  A(9,4),TIME,DELT,HITIME,LF,VF,FEED                               L 0070
      COMMON  ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                                  L 0080
      COMMON  NIC,NIW                                                          L 0090
      REAL    L0,KB,KAY,LF,K1,K2,K3,K4,L,MU                                    L 0100
      REAL    LF0                                                              L 0110
      DO  39  J=1,JT                                                           L 0120
      IF (T(J) .GT. 1000.0)  T(J) = 500.0                                      L 0130
      IF (T0(J) .GT. 1000.0) T0(J) = 500.0                                     L 0140
      DO  39  K=1,10                                                           L 0150
      H(K,J) = 0.0                                                             L 0160
   39 CONTINUE                                                                 L 0170
C                                                                              L 0180
      DO  40  K=1,6                                                            L 0190
       HF(K) = 0.0                                                             L 0200
   40 CONTINUE                                                                 L 0210
      HF51 = 0.0                                                               L 0220
      HF52 = 0.0                                                               L 0230
      HF61 = 0.0                                                               L 0240
      HF62 = 0.0                                                               L 0250
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```
      HF62 = 0.0                                                        L 0250
C                                                                       L 0260
      DO  43  I=1,LC                                                    L 0270
      QE = THALP(AV,T(JF),I)                                            L 0280
      QF = THALP(AV,TF,I)                                               L 0290
      QG = THALP(AL,TF,I)                                               L 0300
      QH = THALP(AV,TFO,I)                                              L 0310
      QI = THALP(AL,TFO,I)                                              L 0320
C                                                                       L 0330
      HS1 = Z(JF-1,I)*QF                                                L 0340
      HS2 = Z(JF,I)*QG                                                  L 0350
      HSO1 = ZO(JF-1,I)*QH                                              L 0360
      HSO2 = ZO(JF,I)*QI                                                L 0370
C                                                                       L 0380
      HF(1) = HF(1) + QE*YF(I)                                          L 0390
      HF(2) = HF(2) + QE*YFO(I)                                         L 0400
      HF(3) = HF(3) + QF*YF(I)                                          L 0410
      HF(4) = HF(4) + QH*YFO(I)                                         L 0420
      HF51 = HF51 + HS1                                                 L 0430
      HF52 = HF52 + HS2                                                 L 0440
      HF61 = HF61 + HSO1                                                L 0450
      HF62 = HF62 + HSO2                                                L 0460
   43 CONTINUE                                                          L 0470
      HF(5) = (HF51*VF + HF52*LF)/FEED/FEED                             L 0480
      HF(6) = (HF61*VFO + HF62*LFO)/FEED/FEED                           L 0490
C                                                                       L 0500
      RETURN                                                            L 0510
      END                                                               L 0520
C                                                                       L 0530
      SUBROUTINE   ENTHA2                                               M 0000
      COMMON   T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU  M 0010
      COMMON    FAC,D,CDUTY,CDUTYO,CXF(4),CXFO(4)                       M 0020
      COMMON   TO(9),SUM(9),AL(4,4),AV(4,4),ZO(9,4),Y(9,4),YFO(4),XFO(4) M 0030
      COMMON   LFO,VFO,TFO                                              M 0040
      COMMON   SVO(9,4),VO(9),YO(9,4),SUO(9,4),UO(9),XO(9,4),SLO(9,4)   M 0050
      COMMON   LO(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)   M 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                       M 0070
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                          M 0080
      COMMON   NIC,NIN                                                  M 0090
      REAL     LO,KB,KAY,LF,K1,K2,K3,K4,L,MU                            M 0100
      REAL     LFO                                                      M 0110
      DO  43  I=1,LC                                                    M 0120
      DO  42  M=1,JR                                                    M 0130
      J = M+1                                                           M 0140
      QA = THALP(AV,T(J),I)                                             M 0150
      QB = THALP(AV,TO(J),I)                                            M 0160
      QC = THALP(AL,T(M),I)                                             M 0170
      QD = THALP(AL,TO(M),I)                                            M 0180
C                                                                       M 0190
      H(1,J) = H(1,J) + QA* X(M,I)                                      M 0200
      H(2,J) = H(2,J) + QA* XO(M,I)                                     M 0210
      H(3,J) = H(3,J) + QA* X(2,I)                                      M 0220
      H(4,J) = H(4,J) + QA* XO(2,I)                                     M 0230
      H(5,J) = H(5,J) + QA* YO(J,I)                                     M 0240
      H(6,J) = H(6,J) + QB* YO(J,I)                                     M 0250
      H(7,M) = H(7,M) + QC* X(M,I)                                      M 0260
      H(8,M) = H(8,M) + QD* XO(M,I)                                     M 0270
      IF (J-JF)  42,42,41                                               M 0280
   41 H(9,J) = H(9,J) + QA*CXF(I)                                       M 0290
      H(10,J) = H(10,J) + QA*CXFO(I)                                    M 0300
   42 CONTINUE                                                          M 0310
   43 CONTINUE                                                          M 0320
C                                                                       M 0330
      RETURN                                                            M 0340
      END                                                               M 0350
C                                                                       M 0360
      SUBROUTINE   LCORP                                                N 0000
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      SUBROUTINE   LCORR                                                  N 0000
      COMMON   T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU   N 0010
      COMMON    FAC,D,CDUTY,CDUTY0,CXF(4),CYF0(4)                  B107 N 0020
      COMMON   T0(9),SUM(9),AL(4,4),AV(4,4),Z0(9,4),Y(9,4),YF0(4),XF0(4)  N 0030
      COMMON   LF0,VF0,TF0                                              N 0040
      COMMON   SV0(9,4),V0(9),Y0(9,4),SU0(9,4),U0(9),X0(9,4),SL0(9,4)   N 0050
      COMMON   L0(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)   N 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                       N 0070
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                          N 0080
      COMMON   NIC,NIW                                                  N 0090
      REAL     L0,KB,KAY,LF,K1,K2,K3,K4,L,MU                            N 0100
      REAL     LF0                                                      N 0110
      CDUTY =  (L(2)+D)*(H(1,3)-H(7,2))+SIG*((L0(2)+D)*(H(2,3)-H(8,2))-  N 0120
     1      V0(3)*(H(5,3)-H(6,3))-CDUTY0) + (U(2)*(H(1,3)-H(7,2)) -      N 0130
     2      U0(2)*(H(2,3)-H(8,2)))/FAC                                   N 0140
C                                                                        N 0150
      SH1= VF*(HF(1) - HF(3)) + SIG*VF0*(HF(2)-HF(4))                   N 0160
C                                                                        N 0170
      DO  490  J=3,JL                                                   N 0180
      M = J+1                                                           N 0190
      IF (M-JF)  44,45,46                                               N 0200
   44 SH = 0.0                                                          N 0210
      GO TO 47                                                          N 0220
   45 SH = SH1                                                          N 0230
      GO TO 47                                                          N 0240
   46 SH = FEED*(H(9,M)-HF(5)) + SIG*FEED*(H(10,M)-HF(6))               N 0250
   47 CONTINUE                                                          N 0260
      HSUM = 0.0                                                        N 0270
      DO  49  K=2,J                                                     N 0280
      HS = 0.0                                                          N 0290
      HS0 = 0.0                                                         N 0300
      DO  480  I=1,LC                                                   N 0310
      HS = HS + THALP(AV,T(M),I)* X(K,I)                                N 0320
      HS0 = HS0 + THALP(AV,T(M),I)* X0(K,I)                             N 0330
  480 CONTINUE                                                          N 0340
      HSUM = HSUM + U(K)*(HS-H(7,K)) - U0(K)*(HS0-H(8,K))               N 0350
   49 CONTINUE                                                          N 0360
C                                                                        N 0370
      H0 = H(1,M) - H(7,J)                                              N 0380
      L(J) = (-D*(H(3,M)-H(7,2))+CDUTY+SIG*(V0(M)*(H(5,M)-H(6,M)) -     N 0390
     1       L0(J)*(H(2,M)-H(8,J)) - D*(H(4,M)-H(8,2)) + CDUTY0)) / H0  N 0400
     2       - HSUM/FAC/H0 + SH/H0                                      N 0410
C                                                                        N 0420
  490 CONTINUE                                                          N 0430
C                                                                        N 0440
      RETURN                                                            N 0450
      END                                                               N 0460
C                                                                        N 0470
      SUBROUTINE   LCORR2                                               P 0000
      COMMON   T(9),ERPHI,X(9,4),H(11,9),HF(6),L(9),U(9),V(9),TF,SIG,MU   P 0010
      COMMON    FAC,D,CDUTY,CDUTY0,CXF(4),CYF0(4)                       P 0020
      COMMON   T0(9),SUM(9),AL(4,4),AV(4,4),Z0(9,4),Y(9,4),YF0(4),XF0(4)  P 0030
      COMMON   LF0,VF0,TF0                                              P 0040
      COMMON   SV0(9,4),V0(9),Y0(9,4),SU0(9,4),U0(9),X0(9,4),SL0(9,4)   P 0050
      COMMON   L0(9),Z(9,4),XF(4),YF(4),SSU(9),KB(9),KAY(9,4),AK(4,4)   P 0060
      COMMON   A(9,4),TIME,DELT,HITIME,LF,VF,FEED                       P 0070
      COMMON   ITER,LC,JT,JR,JL,JF,IS5,NOV(10)                          P 0080
      COMMON   NIC,NIW                                                  P 0090
      REAL     L0,KB,KAY,LF,K1,K2,K3,K4,L,MU                            P 0100
      REAL     LF0                                                      P 0110
      USUM = 0.0                                                        P 0120
      DO  50  J=2,JR                                                    P 0130
      USUM = USUM + (U(J)-U0(J))                                        P 0140
   50 CONTINUE                                                          P 0150
      L(JR) = (FEED-D) + SIG*(FEED-D-L0(JR)) - USUM/FAC                 P 0160
C                                                                        P 0170
      MM = JR-1                                                         P 0180
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      MM = JL-1                                                          P 0180
      DO  56  J=3,MM                                                     P 0190
      M = J+1                                                      B108  P 0200
      USUM = 0.0                                                         P 0210
      DO  51  K=2,J                                                      P 0220
      USUM = USUM  + (U(K) - UO(K))                                      P 0230
   51 CONTINUE                                                           P 0240
C                                                                        P 0250
      IF (M-JF) 52,53,54                                                 P 0260
   52 Z1 = 0.0                                                           P 0270
      GO TO 55                                                           P 0280
   53 Z1 = VF                                                            P 0290
      GO TO 55                                                           P 0300
   54 Z1 = FEED                                                          P 0310
   55 CONTINUE                                                           P 0320
      V(M) = L(J) + D - Z1 - SIG*(VO(M)+Z1-VO(J)-D) + USUM/FAC           P 0330
   56 CONTINUE                                                           P 0340
C                                                                        P 0350
      V(JR) = L(JL)-L(JR)+SIG*(LO(JL)-LO(JR)-VO(JR))-(U(JR)-UO(JR))/FAC  P 0360
C                                                                        P 0370
      RETURN                                                             P 0380
      END                                                                P 0390
```

APÊNDICE C

APÊNDICE C

RESULTADOS DOS PROGRAMAS PARA REGIME PERMANENTE

ÍNDICE

	Página
CA - Resultados Completos para o Ex. III.1.A	C 1
CB - Resultados Completos para o Ex. III.1.B	C19
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CA - Resultados Completos para o Exemplo III.1.A

INPUT DATA FOR PROB. NO. USING PROGRAM 1

NO. OF COMPONENTS	PLATES IN SECTION M	PLATES IN SECTION M1	PLATES IN SECTION M2	PLATES IN SECTION N
6	4	0	0	4

FEED FLOWS AND ENTHALPIES IN ORDER OF LOWEST ENTERING TO HIGHEST

MOLES FEED LIQUID	MOLES FEED VAPOR	ENTHALPY OF FEED LIQUID	ENTHALPY OF FEED VAPOR
0.30000000E+00	0.41330000E+03	0.70000000E+00	0.12469000E+05
0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00

COMPONENT FEED AMOUNTS

LOWEST FEED		INTERMEDIATE FEED		HIGHEST FEED	
LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
0.43720000E-02	0.95628000E-01	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.18879000E-01	0.18112100E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.37342000E-01	0.19255800E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.67245000E-01	0.19275500E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.10236500E+00	0.97635000E-01	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.69796000E-01	0.30204000E-01	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00

EQUILIBRIUM CONSTANTS A	EQUILIBRIUM CONSTANTS B	EQUILIBRIUM CONSTANTS C	EQUILIBRIUM CONSTANTS D
-0.38460000E+04	0.83580000E+01	0.00000000E+00	0.00000000E+00
-0.40020000E+04	0.78330000E+01	0.00000000E+00	0.00000000E+00
-0.49970000E+04	0.86650000E+01	0.00000000E+00	0.00000000E+00
-0.55950000E+04	0.88470000E+01	0.00000000E+00	0.00000000E+00
-0.63010000E+04	0.92610000E+01	0.00000000E+00	0.00000000E+00
-0.72960000E+04	0.10078000E+02	0.00000000E+00	0.00000000E+00

ENTHALPY CONSTANTS A1	ENTHALPY CONSTANTS A2	ENTHALPY CONSTANTS A3	FOR LIQUID
0.41270000E+02	-0.57780000E+04	0.00000000E+00	
0.52670000E+02	-0.73740000E+04	0.00000000E+00	
0.58600000E+02	-0.82040000E+04	0.00000000E+00	
0.66120000E+02	-0.92580000E+04	0.00000000E+00	
0.73100000E+02	-0.10234000E+05	0.00000000E+00	
0.76940000E+02	-0.10772000E+05	0.00000000E+00	

ENTHALPY CONSTANTS A1	ENTHALPY CONSTANTS A2	ENTHALPY CONSTANTS A3	FOR VAPOR
0.29640000E+02	0.34640000E+04	0.00000000E+00	
0.36790000E+02	0.47340000E+04	0.00000000E+00	
0.42230000E+02	0.58930000E+04	0.00000000E+00	
0.50100000E+02	0.68140000E+04	0.00000000E+00	
0.58250000E+02	0.76070000E+04	0.00000000E+00	
0.62840000E+02	0.90270000E+04	0.00000000E+00	

ERROR LIMIT ON PHI	ERROR LIMIT ON SUMMATION	ERROR LIMIT ON BUBBLE POINT
0.10000000E-03	0.10000000E-02	0.10000000E-03

TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS
0.16000000E+03	0.10000000E+01	0.30000000E+00
0.16000000E+03	0.10000000E+01	0.13000000E+01
0.16000000E+03	0.10000000E+01	0.13000000E+01
0.16000000E+03	0.10000000E+01	0.13000000E+01
0.16000000E+03	0.10000000E+01	0.13000000E+01
0.16000000E+03	0.17000000E+01	0.10000000E+01
0.16000000E+03	0.17000000E+01	0.10000000E+01
0.16000000E+03	0.17000000E+01	0.10000000E+01
0.16000000E+03	0.17000000E+01	0.10000000E+01
0.16000000E+03	0.00000000E+00	0.10000000E+01
0.16000000E+03	0.00000000E+00	0.70000000E+00

OUTPUT WILL BE GIVEN FOR EVERY ITERATION

unesp

PROBLEM NO.

ITERATION NO. = 1

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.16292774E-06 0.33479409E-04 0.30230452E-02 0.12126647E+00 0.54474118E+00
0.33114370E+00

PLATE NO. = 1
0.14858665E-05 0.14643070E-03 0.65861799E-02 0.12899908E+00 0.50476096E+00
0.12355573E+00

PLATE NO. = 2
0.13160673E-04 0.80914453E-03 0.13561123E-01 0.14239012E+00 0.23151507E+00
0.94130689E-01

PLATE NO. = 3
0.11606495E-03 0.24952318E-02 0.27023255E-01 0.16179444E+00 0.21202127E+00
0.90025754E-01

PLATE NO. = 4
0.10229195E-02 0.10170685E-01 0.52762756E-01 0.18783093E+00 0.20994130E+00
0.89519320E-01

PLATE NO. = 5
0.73467852E-02 0.34928352E-01 0.95093378E-01 0.24176215E+00 0.22666423E+00
0.62007567E-01

PLATE NO. = 6
0.73872116E-02 0.35625805E-01 0.99607488E-01 0.25306721E+00 0.18525752E+00
0.25617891E-01

PLATE NO. = 7
0.79760886E-02 0.40323794E-01 0.11313624E+00 0.25877480E+00 0.14336606E+00
0.10328122E-01

PLATE NO. = 8
0.16614834E-01 0.72005944E-01 0.15481712E+00 0.25459954E+00 0.99589658E-01
0.38198574E-02

REFLUX
0.14285707E+00 0.28569994E+00 0.28441870E+00 0.23374294E+00 0.52253781E-01
0.93841244E-03

TOP PRODUCT
0.14285707E+00 0.28569994E+00 0.28441870E+00 0.23374294E+00 0.52253781E-01
0.93841244E-03

BOTTOM PRODUCT RECOVERY FRACTIONS
0.48878322E-06 0.30219113E-04 0.45345678E-02 0.18189970E+00 0.81711177E+00
0.99343111E+00

TOP PRODUCT RECOVERY FRACTIONS
0.99999951E+00 0.99994978E+00 0.99546543E+00 0.81810030E+00 0.18288823E+00
0.65688871E-02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.10000000E+00	0.48878322E-07	0.99999951E-01
2	0.20000000E+00	0.10043823E-04	0.19998996E+00

3	0,20000000E+00	0,90691356E-03	0,19909309E+00
4	0,20000000E+00	0,36379940E-01	0,16362006E+00
5	0,20000000E+00	0,16342235E+00	0,36577647E-01
6	0,10000000E+00	0,99343111E-01	0,65688870E-03
	0,10000000E+01	0,30000000E+00	0,70000000E+00

C4

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10002020E+01	0,16000000E+03	0,10000000E+01	0,30000000E+00	0,00000000E+00	0,00000000E+00
0,56404986E+00	0,16000000E+03	0,10000000E+01	0,13000000E+01	0,00000000E+00	0,00000000E+00
0,48221930E+00	0,16000000E+03	0,10000000E+01	0,13000000E+01	0,00000000E+00	0,00000000E+00
0,49347601E+00	0,16000000E+03	0,10000000E+01	0,13000000E+01	0,00000000E+00	0,00000000E+00
0,55124792E+00	0,16000000E+03	0,10000000E+01	0,13000000E+01	0,00000000E+00	0,00000000E+00
0,66780246E+00	0,16000000E+03	0,17000000E+01	0,10000000E+01	0,00000000E+00	0,00000000E+00
0,60656512E+00	0,16000000E+03	0,17000000E+01	0,10000000E+01	0,00000000E+00	0,00000000E+00
0,57390710E+00	0,16000000E+03	0,17000000E+01	0,10000000E+01	0,00000000E+00	0,00000000E+00
0,60144695E+00	0,16000000E+03	0,17000000E+01	0,10000000E+01	0,00000000E+00	0,00000000E+00
0,99991084E+00	0,16000000E+03	0,00000000E+00	0,10000000E+01	0,00000000E+00	0,00000000E+00
0,99991084E+00	0,16000000E+03	0,00000000E+00	0,70000000E+00	0,00000000E+00	0,00000000E+00

CONDENSER LOAD = 0,00000000E+00

REBOILER LOAD = 0,00000000E+00

PHI = 0,23815521E+00

BP 6
BP 5
BP 5
BP 5
BP 4
BP 3
BP 4
BP 4
BP 5
BP 6
DP 3

PROBLEM NO:

ITERATION NO. = 2

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.43383221E-07 0.85872430E-05 0.59890009E-03 0.67661617E-01 0.59902605E+00
0.33273403E+00

PLATE NO. = 1
0.60865923E-06 0.58248534E-04 0.22604964E-02 0.13419725E+00 0.62737438E+00
0.22110252E+00

PLATE NO. = 2
0.75521560E-05 0.34226949E-03 0.70835140E-02 0.21831074E+00 0.57415896E+00
0.15854123E+00

PLATE NO. = 3
0.87414325E-04 0.18614022E-02 0.19972035E-01 0.31473823E+00 0.50000021E+00
0.13074309E+00

PLATE NO. = 4
0.94207840E-03 0.93863563E-02 0.50986852E-01 0.40547324E+00 0.42438596E+00
0.11748306E+00

PLATE NO. = 5
0.71523659E-02 0.34728128E-01 0.10670729E+00 0.52793789E+00 0.40943017E+00
0.79000398E-01

PLATE NO. = 6
0.77863752E-02 0.39334174E-01 0.13154096E+00 0.57696709E+00 0.30208528E+00
0.27628886E-01

PLATE NO. = 7
0.95733921E-02 0.51547847E-01 0.17065665E+00 0.56158403E+00 0.19206953E+00
0.83389891E-02

PLATE NO. = 8
0.22409903E-01 0.98297196E-01 0.22976635E+00 0.46086928E+00 0.98838673E-01
0.20553258E-02

REFLUX
0.14285712E+00 0.28571061E+00 0.28545751E+00 0.25671645E+00 0.28987980E-01
0.25684559E-03

TOP PRODUCT
0.14285712E+00 0.28571061E+00 0.28545751E+00 0.25671645E+00 0.28987980E-01
0.25684559E-03

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13014966E-06 0.12880865E-04 0.89835014E-03 0.10149243E+00 0.89854207E+00
0.99820208E+00

TOP PRODUCT RECOVERY FRACTIONS
0.99999987E+00 0.99998712E+00 0.99910155E+00 0.89850758E+00 0.10145793E+00
0.17979192E-02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.10000000E+00	0.13014966E-07	0.99999987E-01
2	0.20000000E+00	0.25761729E-05	0.19999742E+00

BSCTZ

3	0.20000001E+00	0.17967003E-03	0.19982033E+00
4	0.20000000E+00	0.20298485E-01	0.17970151E+00
5	0.20000000E+00	0.17970841E+00	0.20291586E-01
6	0.10000000E+00	0.99820208E-01	0.17979192E-03
	0.10000000E+01	0.30000000E+00	0.70000000E+00

C6

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000312E+01	0.22370083E+03	0.90000000E+00	0.30000000E+00	0.20405183E+05	0.61501049E+04
0.98499350E+00	0.21136714E+03	0.90000000E+00	0.12000000E+01	0.18980759E+05	0.51502129E+04
0.95844426E+00	0.20353575E+03	0.90000000E+00	0.12000000E+01	0.18056406E+05	0.45329590E+04
0.96740238E+00	0.19548507E+03	0.90000000E+00	0.12000000E+01	0.17092798E+05	0.39171783E+04
0.10086575E+01	0.18238962E+03	0.90000000E+00	0.12000000E+01	0.15558003E+05	0.29465042E+04
0.11649562E+01	0.15843099E+03	0.17924472E+01	0.90000000E+00	0.13078736E+05	0.12426147E+04
0.10853447E+01	0.15146086E+03	0.18000000E+01	0.10924472E+01	0.12588214E+05	0.76025498E+03
0.99397044E+00	0.14361127E+03	0.17886213E+01	0.11000000E+01	0.12005764E+05	0.28519863E+03
0.91223673E+00	0.13148512E+03	0.17000000E+01	0.10886213E+01	0.10988471E+05	-0.10459465E+04
0.99998662E+00	0.70978597E+02	0.00000000E+00	0.10000000E+01	0.00000000E+00	-0.39320036E+04
0.99998662E+00	0.70978597E+02	0.00000000E+00	0.70000000E+00	0.00000000E+00	-0.39320036E+04

CONDENSER LOAD = 0.25364807E+05

REBOILER LOAD = 0.11575136E+05

PHI = 0.41158144E+00

PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	4
PP	3
PP	4

PROBLEM NO.

ITERATION NO. = 3

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.67961422E-07 0.13059361E-04 0.78314144E-03 0.71303409E-01 0.59523748E+00
0.33266771E+00

PLATE NO. = 1
0.85282748E-06 0.79468591E-04 0.26807276E-02 0.13198512E+00 0.64514483E+00
0.23313200E+00

PLATE NO. = 2
0.97424689E-05 0.43111606E-03 0.78861921E-02 0.20729113E+00 0.62754570E+00
0.17732315E+00

PLATE NO. = 3
0.10329664E-03 0.21528179E-02 0.20726105E-01 0.28521284E+00 0.56500456E+00
0.14785389E+00

PLATE NO. = 4
0.10102061E-02 0.98708956E-02 0.48728677E-01 0.34516264E+00 0.46117440E+00
0.13139254E+00

PLATE NO. = 5
0.67250052E-02 0.31965224E-01 0.89567151E-01 0.40798510E+00 0.43040960E+00
0.82632038E-01

PLATE NO. = 6
0.74731644E-02 0.37002308E-01 0.11589818E+00 0.50144227E+00 0.35108445E+00
0.33119208E-01

PLATE NO. = 7
0.94606229E-02 0.50458861E-01 0.16405971E+00 0.55159469E+00 0.23963551E+00
0.11018741E-01

PLATE NO. = 8
0.23376597E-01 0.10271044E+00 0.24269558E+00 0.49698039E+00 0.12527931E+00
0.27868494E-02

REFLUX
0.14285711E+00 0.28570869E+00 0.28537855E+00 0.25515568E+00 0.30612509E-01
0.28526817E-03

TOP PRODUCT
0.14285711E+00 0.28570869E+00 0.28537855E+00 0.25515568E+00 0.30612509E-01
0.28526817E-03

BOTTOM PRODUCT RECOVERY FRACTIONS
0.20388427E-06 0.19589041E-04 0.11747122E-02 0.10695511E+00 0.89285622E+00
0.99800312E+00

TOP PRODUCT RECOVERY FRACTIONS
0.99999980E+00 0.99998041E+00 0.99882529E+00 0.89304489E+00 0.10714378E+00
0.19968772E-02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.10000000E+00	0.20388427E-07	0.99999979E-01
2	0.20000000E+00	0.39178082E-05	0.19999608E+00

3	0.20000000E+00	0.23494243E-03	0.19976506E+00
4	0.20000000E+00	0.21391023E-01	0.17860898E+00
5	0.20000000E+00	0.17857124E+00	0.21428756E-01
6	0.10000000E+00	0.99800312E-01	0.19968772E-03
	0.10000000E+01	0.30000000E+00	0.70000000E+00

C8

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000049E+01	0.22792350E+03	0.81000000E+00	0.30000000E+00	0.20987859E+05	0.64970275E+04
0.10130230E+01	0.21906504E+03	0.81000000E+00	0.11100000E+01	0.19954677E+05	0.57696363E+04
0.10204870E+01	0.21046600E+03	0.81000000E+00	0.11100000E+01	0.18954943E+05	0.50755687E+04
0.10210535E+01	0.20117871E+03	0.81000000E+00	0.11100000E+01	0.17882534E+05	0.43436433E+04
0.10173394E+01	0.18886417E+03	0.81000000E+00	0.11100000E+01	0.16448088E+05	0.34096282E+04
0.10492841E+01	0.16994614E+03	0.16832025E+01	0.80999999E+00	0.14362440E+05	0.20376932E+04
0.10460196E+01	0.16071053E+03	0.16900000E+01	0.98320248E+00	0.13612757E+05	0.13819990E+04
0.10262261E+01	0.14914722E+03	0.16912593E+01	0.99000000E+00	0.12631184E+05	0.59689471E+03
0.99383116E+00	0.12767018E+03	0.17000000E+01	0.99125933E+00	0.10783079E+05	-0.90769104E+03
0.99999791E+00	0.70779284E+02	0.00000000E+00	0.10000000E+01	0.00000000E+00	-0.39311298E+04
0.99999791E+00	0.70779284E+02	0.00000000E+00	0.70000000E+00	0.00000000E+00	-0.39311298E+04

CONDENSER LOAD = 0.25014156E+05

REBOILER LOAD = 0.11329173E+05

PHI = 0.75099216E+00

PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	2
PP	3

SL/SSD

PROBLEM NO.

ITERATION NO. = 4

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.86874998E-07 0.16848550E-04 0.95438213E-03 0.76082002E-01 0.59042864E+00
0.33256750E+00

PLATE NO. = 1
0.10457325E-05 0.96363627E-04 0.30804052E-02 0.13431563E+00 0.63482990E+00
0.23503720E+00

PLATE NO. = 2
0.11269887E-04 0.49365843E-03 0.85862637E-02 0.20236994E+00 0.61869876E+00
0.16247705E+00

PLATE NO. = 3
0.11371650E-03 0.23478055E-02 0.21594921E-01 0.26995630E+00 0.56488570E+00
0.15564864E+00

PLATE NO. = 4
0.10645610E-02 0.10315073E-01 0.48980283E-01 0.31965131E+00 0.49217708E+00
0.14127162E+00

PLATE NO. = 5
0.66959466E-02 0.31566695E-01 0.85593057E-01 0.36864691E+00 0.44393988E+00
0.89561048E-01

PLATE NO. = 6
0.73170505E-02 0.35958849E-01 0.10969419E+00 0.46277578E+00 0.37145368E+00
0.37278296E-01

PLATE NO. = 7
0.92441317E-02 0.49108920E-01 0.15777451E+00 0.52669146E+00 0.25917886E+00
0.12803792E+01

PLATE NO. = 8
0.23307879E-01 0.10239594E+00 0.24171908E+00 0.49316860E+00 0.13773546E+00
0.33133261E-02

REFLUX
0.14285710E+00 0.28570706E+00 0.28530526E+00 0.25310771E+00 0.32673439E-01
0.32821485E-03

TOP PRODUCT
0.14285710E+00 0.28570706E+00 0.28530526E+00 0.25310771E+00 0.32673439E-01
0.32821485E-03

BOTTOM PRODUCT RECOVERY FRACTIONS
0.26602500E-06 0.25272824E-04 0.14315732E-02 0.11412300E+00 0.88564296E+00
0.99770250E+00

TOP PRODUCT RECOVERY FRACTIONS
0.99999973E+00 0.99997473E+00 0.99856843E+00 0.86587700E+00 0.11435704E+00
0.22975040E-02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.10000000E+00	0.26602499E-07	0.99999973E-01
2	0.20000000E+00	0.50545648E-05	0.19999494E+00

3	0.20000000E+00	0.28631464E-03	0.19971358E+00
4	0.20000000E+00	0.22824601E-01	0.17717540E+00
5	0.20000000E+00	0.17712859E+00	0.22871407E-01
6	0.10000000E+00	0.99770249E-01	0.22975040E-03
	0.10000000E+01	0.30000000E+00	0.70000000E+00

C10

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000495E+01	0.22763200E+03	0.73650314E+00	0.30000000E+00	0.20946103E+05	0.64729923E+04
0.10073605E+01	0.21956011E+03	0.74080596E+00	0.10365031E+01	0.20008393E+05	0.58103689E+04
0.10126369E+01	0.21207453E+03	0.73914773E+00	0.10408060E+01	0.19131117E+05	0.52055158E+04
0.10145471E+01	0.20387215E+03	0.72900000E+00	0.10391477E+01	0.18155463E+05	0.45576864E+04
0.10134599E+01	0.19230867E+03	0.72899999E+00	0.10290000E+01	0.16748314E+05	0.36770171E+04
0.10260235E+01	0.17294274E+03	0.16345201E+01	0.72899999E+00	0.14555239E+05	0.22601678E+04
0.10244778E+01	0.16391773E+03	0.16651282E+01	0.93452086E+00	0.13839234E+05	0.16095169E+04
0.10146018E+01	0.15194131E+03	0.16758106E+01	0.96512819E+00	0.12837258E+05	0.78476041E+03
0.10016403E+01	0.12793451E+03	0.17000000E+01	0.97581063E+00	0.10797343E+05	-0.79307537E+03
0.99997880E+00	0.70792704E+02	0.00000000E+00	0.10000000E+01	0.00000000E+00	-0.39312221E+04
0.99997880E+00	0.70792704E+02	0.00000000E+00	0.70000000E+00	0.00000000E+00	-0.39312221E+04

CONDENSER LOAD = 0.25035560E+05

REBOILER LOAD = 0.11346302E+05

PHI = 0.90688125E+00

PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	3
PP	2
DP	3

unesp

PROBLEM NO.

ITERATION NO. = 5

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,96539132E+07 0,18240306E-04 0,10165029E-02 0,77740608E-01 0,56882418E+00
0,33252532E+00

PLATE NO. = 1
0,11167342E-05 0,10254547E-03 0,32225359E-02 0,13498380E+00 0,62982983E+00
0,23406469E+00

PLATE NO. = 2
0,11856808E-04 0,51750351E-03 0,88452610E-02 0,20057225E+00 0,61241311E+00
0,18197883E+00

PLATE NO. = 3
0,11829699E-03 0,24337656E-02 0,22008233E-01 0,26512923E+00 0,56013024E+00
0,15517986E+00

PLATE NO. = 4
0,10902776E-02 0,10606825E-01 0,49593397E-01 0,31248730E+00 0,49047778E+00
0,14146437E+00

PLATE NO. = 5
0,66044165E-02 0,31071758E-01 0,83389850E-01 0,35315301E+00 0,44632463E+00
0,92077780E-01

PLATE NO. = 6
0,72190656E-02 0,35380656E-01 0,10678030E+00 0,44590861E+00 0,37535408E+00
0,38608064E-01

PLATE NO. = 7
0,91406637E-02 0,48466926E-01 0,15481483E+00 0,51504014E+00 0,26461157E+00
0,13462896E-01

PLATE NO. = 8
0,23219888E-01 0,10199372E+00 0,24051782E+00 0,48998661E+00 0,14169618E+00
0,35244701E-02

REFLUX
0,14285710E+00 0,28570647E+00 0,28527854E+00 0,25239688E+00 0,33361066E-01
0,34628955E-03

TOP PRODUCT
0,14285710E+00 0,28570647E+00 0,28527854E+00 0,25239688E+00 0,33361066E-01
0,34628955E-03

BOTTOM PRODUCT RECOVERY FRACTIONS
0,28961740E-06 0,27360458E-04 0,15247544E-02 0,11661091E+00 0,88323627E+00
0,99757597E+00

TOP PRODUCT RECOVERY FRACTIONS
0,99999971E+00 0,99997264E+00 0,99847525E+00 0,88338909E+00 0,11676373E+00
0,24240268E-02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,10000000E+00	0,28961740E-07	0,99999971E-01
2	0,20000000E+00	0,54720916E-05	0,19999453E+00

659178

3	0.20000000E+00	0.30495087E-03	0.19969505E+00
4	0.20000000E+00	0.23322182E-01	0.17667782E+00
5	0.20000000E+00	0.17664725E+00	0.23352746E-01
6	0.10000000E+00	0.99757597E-01	0.24240258E-03
	0.10000000E+01	0.30000000E+00	0.70000000E+00

C12

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10001249E+01	0.22725994E+03	0.74014603E+00	0.30000000E+00	0.20893884E+05	0.64423326E+04
0.10022045E+01	0.21938853E+03	0.74569122E+00	0.10401460E+01	0.19979871E+05	0.57966139E+04
0.10039388E+01	0.21230723E+03	0.74450715E+00	0.10456912E+01	0.19146402E+05	0.52248827E+04
0.10049996E+01	0.20458128E+03	0.73120907E+00	0.10446022E+01	0.18214763E+05	0.46153953E+04
0.10057279E+01	0.19343192E+03	0.68073827E+00	0.10312091E+01	0.16831182E+05	0.37660642E+04
0.10126215E+01	0.17432380E+03	0.16339135E+01	0.68073827E+00	0.14641489E+05	0.23638005E+04
0.10093313E+01	0.16944168E+03	0.16603677E+01	0.93391552E+00	0.13943910E+05	0.17190318E+04
0.10055570E+01	0.15317711E+03	0.16706249E+01	0.95036766E+00	0.12921920E+05	0.86P95514E+03
0.10009387E+01	0.12827447E+03	0.17000000E+01	0.97062495E+00	0.10815381E+05	-0.75190477E+03
0.99994645E+00	0.70808948E+02	0.00000000E+00	0.10000000E+01	0.00000000E+00	-0.39313519E+04
0.99994645E+00	0.70808948E+02	0.00000000E+00	0.70000000E+00	0.00000000E+00	-0.39313519E+04

CONDENSER LOAD = 0.25069446E+05

REBOILER LOAD = 0.11367900E+05

PHI = 0.97934708E+00

PP	2
PP	2
PP	2
PP	0
PP	2
PP	3
PP	3
PP	3
PP	2
PP	0
DP	2

PROBLEM NO.

ITERATION NO, = 6

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.97885246E-07 0.18487718E-04 0.10282312E-02 0.76028267E-01 0.58843010E+00
0.33251534E+00

PLATE NO, = 1
0.11274908E-05 0.10348966E-03 0.32449180E-02 0.13490726E+00 0.62839852E+00
0.23375308E+00

PLATE NO, = 2
0.11922753E-04 0.52014432E-03 0.88686077E-02 0.19967071E+00 0.61033079E+00
0.18124195E+00

PLATE NO, = 3
0.11853272E-03 0.24374641E-02 0.21985678E-01 0.26308322E+00 0.55804687E+00
0.15493710E+00

PLATE NO, = 4
0.10968337E-02 0.10587881E-01 0.49379495E-01 0.30920211E+00 0.48872694E+00
0.14132827E+00

PLATE NO, = 5
0.65700540E-02 0.30880739E-01 0.82515516E-01 0.34694359E+00 0.44195755E+00
0.91395425E-01

PLATE NO, = 6
0.71852216E-02 0.35182260E-01 0.10579699E+00 0.44021398E+00 0.37423588E+00
0.38754466E-01

PLATE NO, = 7
0.91056285E-02 0.48250913E-01 0.15382889E+00 0.51120712E+00 0.26518688E+00
0.13598132E-01

PLATE NO, = 8
0.23190031E-01 0.10185734E+00 0.24011340E+00 0.46904022E+00 0.14256926E+00
0.35721901E-02

REFLUX
0.14285710E+00 0.28570636E+00 0.28527352E+00 0.25227360E+00 0.33529959E-01
0.35056802E-03

TOP PRODUCT
0.14285710E+00 0.28570636E+00 0.28527352E+00 0.25227360E+00 0.33529959E-01
0.35056802E-03

BOTTOM PRODUCT RECOVERY FRACTIONS
0.29365574E-06 0.27731577E-04 0.15423458E-02 0.11704240E+00 0.88264515E+00
0.99754602E+00

TOP PRODUCT RECOVERY FRACTIONS
0.99999971E+00 0.99997227E+00 0.99845765E+00 0.88295760E+00 0.11735485E+00
0.24539762E-02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.10000000E+00	0.29365574E-07	0.99999970E-01
2	0.20000000E+00	0.55463154E-05	0.19999445E+00

3	0.20000000E+00	0,30846936E-03	0.19969193E+00
4	0.20000000E+00	0,23408480E-01	0.17659152E+00
5	0.20000000E+00	0,17652903E+00	0,23470971E-01
6	0.10000000E+00	0,99754602E-01	0,24539791E-03
	0,10000000E+01	0,30000000E+00	0,70000000E+00

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000205E+01	0,22713552E+03	0,74111545E+00	0,30000000E+00	0,20876043E+05	0,64320364E+04
0,10004084E+01	0,21928141E+03	0,74691759E+00	0,10411154E+01	0,19964090E+05	0,57879197E+04
0,10005441E+01	0,21226064E+03	0,74579252E+00	0,10469176E+01	0,19138006E+05	0,52213405E+04
0,10006089E+01	0,20458128E+03	0,73199210E+00	0,10457925E+01	0,18209186E+05	0,46159412E+04
0,10003215E+01	0,19337637E+03	0,68460013E+00	0,10319921E+01	0,16813467E+05	0,37629314E+04
0,10002629E+01	0,17497610E+03	0,16315078E+01	0,68460013E+00	0,14688935E+05	0,24124104E+04
0,10013688E+01	0,16597413E+03	0,16587421E+01	0,93150784E+00	0,13979594E+05	0,17575234E+04
0,10011796E+01	0,15359531E+03	0,16689809E+01	0,95874210E+00	0,12949460E+05	0,89760946E+03
0,10003424E+01	0,12839021E+03	0,17000000E+01	0,95898090E+00	0,10821538E+05	-0,73846974E+03
0,99999120E+00	0,70808948E+02	0,00000000E+00	0,10000000E+01	0,00000000E+00	-0,39316902E+04
0,99999120E+00	0,70808948E+02	0,00000000E+00	0,70000000E+00	0,00000000E+00	-0,39316902E+04

CONDENSER LOAD = 0.25080148E+05

REBOILER LOAD = 0.11375276E+05

PHI = 0.99722207E+00

```
BP    2
BP    2
BP    2
BP    2
BP    2
BP    2
BP    2
BP    2
BP    2
BP    2
DP    0
```

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PROBLEM NO.

ITERATION NO. = 7

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.98025470E-07 0.18514058E-04 0.10295163E-02 0.78093812E-01 0.58847532E+00
0.35251563E+00

PLATE NO. = 1
0.11283305E-05 0.10356475E-03 0.32465243E-02 0.13492315E+00 0.62824158E+00
0.23368500E+00

PLATE NO. = 2
0.11924770E-04 0.52021865E-03 0.88674936E-02 0.19957883E+00 0.61007789E+00
0.18117268E+00

PLATE NO. = 3
0.11851253E-03 0.24369895E-02 0.21975815E-01 0.26289134E+00 0.55787856E+00
0.15489500E+00

PLATE NO. = 4
0.10965788E-02 0.10585285E-01 0.49359079E-01 0.30900514E+00 0.48874525E+00
0.14131736E+00

PLATE NO. = 5
0.65661596E-02 0.30863988E-01 0.82473746E-01 0.34672540E+00 0.44198478E+00
0.91396068E-01

PLATE NO. = 6
0.71793795E-02 0.35150588E-01 0.10565821E+00 0.43943783E+00 0.37367804E+00
0.38691688E-01

PLATE NO. = 7
0.90965383E-02 0.48208808E-01 0.15364450E+00 0.51047825E+00 0.26484514E+00
0.13561045E-01

PLATE NO. = 8
0.23183172E-01 0.10182601E+00 0.24002091E+00 0.48880733E+00 0.14248781E+00
0.35709212E-02

REFLUX
0.14285710E-00 0.28570635E+00 0.28527306E+00 0.25224551E+00 0.33510578E+01
0.35044558E-03

TOP PRODUCT
0.14285710E+00 0.28570635E+00 0.28527306E+00 0.25224551E+00 0.33510578E+01
0.35044558E-03

BOTTOM PRODUCT RECOVERY FRACTIONS
0.29407641E-06 0.27771088E-04 0.15442744E-02 0.11714072E+00 0.88271298E+00
0.99754688E+00

TOP PRODUCT RECOVERY FRACTIONS
0.99999970E+00 0.99997223E+00 0.99845573E+00 0.88285928E+00 0.11728702E+00
0.24531190E-02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.10000000E+00	0.29407641E-07	0.99999970E-01
2	0.20000000E+00	0.55542175E-05	0.19999445E+00

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3	0,20000000E+00	0,30885488E-03	0,19969114E+00
4	0,20000000E+00	0,23428144E-01	0,17657186E+00
5	0,20000000E+00	0,17654259E+00	0,23457405E-01
6	0,10000000E+00	0,99754688E-01	0,24531190E-03
	0,10000000E+01	0,30000000E+00	0,70000000E+00

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10001329E+01	0,22710807E+03	0,74136181E+00	0,30000000E+00	0,20872583E+05	0,64298227E+04
0,10002009E+01	0,21926357E+03	0,74725717E+00	0,10413618E+01	0,19962466E+05	0,57865242E+04
0,10002290E+01	0,21226856E+03	0,74618143E+00	0,10472572E+01	0,19138516E+05	0,52220460E+04
0,10001962E+01	0,20462117E+03	0,73235716E+00	0,10461814E+01	0,18212570E+05	0,46192124E+04
0,10001087E+01	0,19343801E+03	0,68450913E+00	0,10323572E+01	0,16817854E+05	0,37679157E+04
0,10000101E+01	0,17495291E+03	0,16329074E+01	0,65450913E+00	0,14681967E+05	0,24110764E+04
0,99979573E+00	0,16603301E+03	0,16590749E+01	0,93290741E+00	0,13981540E+05	0,17619345E+04
0,99985627E+00	0,15367044E+03	0,16686757E+01	0,95907489E+00	0,12953888E+05	0,90279735E+03
0,99989616E+00	0,12841683E+03	0,17000000E+01	0,96887566E+00	0,10823086E+05	-0,73501869E+03
0,99994305E+00	0,70817414E+02	0,00000000E+00	0,10000000E+01	0,00000000E+00	-0,39313254E+04
0,99994305E+00	0,70817414E+02	0,00000000E+00	0,70000000E+00	0,00000000E+00	-0,39313254E+04

CONDENSER LOAD = 0,25082499E+05

REBOILER LOAD = 0,11377218E+05

PHI = 0,10000000E+01

***ERR 07620 DSC

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 FORTRAN IV, CD22546,004,    JUL   1967
$JOB     NOLIST,NOCARDS
$PAUSE
CARDS REMAINING IN DECK ARE--

MAY 14 68      05 36.8
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CB - Resultados Completos para o Exemplo III.1.B

Formato A 4 - 210x297 mm

INPUT DATA FOR PROB. NO. USING PROGRAM 1

NO. OF COMPONENTS	PLATES IN SECTION M	PLATES IN SECTION M1	PLATES IN SECTION M2	PLATES IN SECTION N
3	2	0	0	3

FEED FLOWS AND ENTHALPIES IN ORDER OF LOWEST ENTERING TO HIGHEST

MOLES FEED LIQUID	MOLES FEED VAPOR	ENTHALPY OF FEED LIQUID	ENTHALPY OF FEED VAPOR
0.10000000E+03	0.11870478E+07	0.00000000E+00	0.00000000E+00
0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00

COMPONENT FEED AMOUNTS

LOWEST FEED		INTERMEDIATE FEED		HIGHEST FEED	
LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
0.60000000E+02	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.20000000E+02	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00
0.20000000E+02	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00	0.00000000E+00

EQUILIBRIUM CONSTANTS A	EQUILIBRIUM CONSTANTS B	EQUILIBRIUM CONSTANTS C	EQUILIBRIUM CONSTANTS D
-0.14512474E+00	0.53638924E-03	-0.33051604E-07	-0.17358329E-09
0.11506919E-01	-0.33885839E-03	0.97795400E-06	-0.54235941E-09
-0.14181715E+00	0.36866353E-03	0.16521412E-06	-0.24823843E-09

ENTHALPY CONSTANTS A1	ENTHALPY CONSTANTS A2	ENTHALPY CONSTANTS A3	FOR LIQUID
-0.14500060E+02	0.19802223E+00	-0.29048837E-04	
-0.23870410E+02	0.26768089E+00	-0.44197795E-04	
-0.20298110E+02	0.23005743E+00	-0.38663417E-04	

ENTHALPY CONSTANTS A1	ENTHALPY CONSTANTS A2	ENTHALPY CONSTANTS A3	FOR VAPOR
0.81795910E+02	0.38981919E-01	0.36470900E-04	
0.85834950E+02	0.15223917E+00	-0.34018595E-04	
0.15266798E+03	-0.11534842E+00	0.14664125E-03	

ERROR LIMIT ON PHI	ERROR LIMIT ON SUMMATION	ERROR LIMIT ON BUBBLE POINT
0.10000000E-03	0.10000000E-02	0.10000000E-03

TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS
0.18071488E+03	0.15000000E+03	0.50000000E+02
0.18071488E+03	0.15000000E+03	0.20000000E+03
0.18071488E+03	0.15000000E+03	0.20000000E+03
0.18071488E+03	0.15000000E+03	0.10000000E+03
0.18071488E+03	0.15000000E+03	0.10000000E+03
0.18071488E+03	0.15000000E+03	0.10000000E+03
0.18071488E+03	0.00000000E+00	0.10000000E+03
0.18071488E+03	0.00000000E+00	0.50000000E+02

OUTPUT WILL BE GIVEN FOR EVERY ITERATION

PROBLEM NO.

ITERATION NO, = 1

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.24499563E+00 0.39996865E+00 0.35503916E+00

PLATE NO. = 1
0.33060484E+00 0.12880520E+00 0.24408356E+00

PLATE NO. = 2
0.42530239E+00 0.10927129E+00 0.19576992E+00

PLATE NO. = 3
0.46122328E+00 0.15939285E-01 0.15144621E+00

PLATE NO. = 4
0.52471305E+00 0.23119762E-02 0.11172633E+00

PLATE NO. = 5
0.66098892E+00 0.32209503E-03 0.76404210E-01

REFLUX
0.95500438E+00 0.31351993E-04 0.44960839E-01

TOP PRODUCT
0.95500438E+00 0.31351993E-04 0.44960839E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.20416302E+00 0.99992162E+00 0.98759790E+00

TOP PRODUCT RECOVERY FRACTIONS
0.79583698E+00 0.78379982E-04 0.11240210E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.60000000E+02	0.12249781E+02	0.47750219E+02
2	0.20000000E+02	0.19998432E+02	0.15675996E-02
3	0.20000000E+02	0.17751958E+02	0.22480419E+01
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000034E+01	0.18071488E+03	0.15000000E+03	0.50000000E+02	0.00000000E+00	0.00000000E+00
0.70349360E+00	0.18071488E+03	0.15000000E+03	0.20000000E+03	0.00000000E+00	0.00000000E+00
0.73034360E+00	0.18071488E+03	0.15000000E+03	0.20000000E+03	0.00000000E+00	0.00000000E+00
0.92860878E+00	0.18071488E+03	0.15000000E+03	0.10000000E+03	0.00000000E+00	0.00000000E+00
0.93879136E+00	0.18071488E+03	0.15000000E+03	0.10000000E+03	0.00000000E+00	0.00000000E+00
0.73771522E+00	0.18071488E+03	0.15000000E+03	0.10000000E+03	0.00000000E+00	0.00000000E+00
0.99999657E+00	0.18071488E+03	0.00000000E+00	0.10000000E+03	0.00000000E+00	0.00000000E+00
0.99999657E+00	0.18071488E+03	0.00000000E+00	0.50000000E+02	0.00000000E+00	0.00000000E+00

CONDENSER LOAD = 0.00000000E+00

REBOILER LOAD = 0.00000000E+00

PHI = 0.94813620E+00

PROBLEM NO.

ITERATION NO. = 2

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.23057602E+00 0.39999200E+00 0.36942221E+00

PLATE NO. = 1
0.43319907E+00 0.17574263E+00 0.37868137E+00

PLATE NO. = 2
0.56573959E+00 0.12277469E+00 0.28354228E+00

PLATE NO. = 3
0.71852000E+00 0.18011757E-01 0.23651058E+00

PLATE NO. = 4
0.81703076E+00 0.16236742E-02 0.14924430E+00

PLATE NO. = 5
0.89791944E+00 0.15353766E-03 0.78118783E-01

REFLUX
0.96942399E+00 0.80010380E-05 0.30577791E-01

TOP PRODUCT
0.96942399E+00 0.80010380E-05 0.30577791E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.19214668E+00 0.99998000E+00 0.92355552E+00

TOP PRODUCT RECOVERY FRACTIONS
0.80785332E+00 0.20002595E-04 0.76444478E-01

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.60000000E+02	0.11528801E+02	0.48471199E+02
2	0.20000000E+02	0.19999600E+02	0.40005190E-03
3	0.20000000E+02	0.18471110E+02	0.15288895E+01
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.99999023E+00	0.24674017E+03	0.13500000E+03	0.50000000E+02	0.19322165E+05	0.16576168E+05
0.98762307E+00	0.19449209E+03	0.13585729E+03	0.18500000E+03	0.16445422E+05	0.12635972E+05
0.97205656E+00	0.17955305E+03	0.14000000E+03	0.18585729E+03	0.15678161E+05	0.11645677E+05
0.97304243E+00	0.15824438E+03	0.14508277E+03	0.90000000E+02	0.14876151E+05	0.10028731E+05
0.96809874E+00	0.14981098E+03	0.14838961E+03	0.93082766E+02	0.14518907E+05	0.94804641E+04
0.97619176E+00	0.14462441E+03	0.15000000E+03	0.98389610E+02	0.14288214E+05	0.91230209E+04
0.10000098E+01	0.13921980E+03	0.00000000E+00	0.10000000E+03	0.00000000E+00	0.88638763E+04
0.10000098E+01	0.13921980E+03	0.00000000E+00	0.50000000E+02	0.00000000E+00	0.88638763E+04

CONDENSER LOAD = 0.81565060E+06

REBOILER LOAD = 0.89860499E+06

PHI = 0.10000000E+01

PROBLEM NO.

ITERATION NO. = 3

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.25178196E+00 0.39999168E+00 0.36822918E+00

PLATE NO. = 1
0.43738362E+00 0.18417801E+00 0.38251405E+00

PLATE NO. = 2
0.57710859E+00 0.13230761E+00 0.29366270E+00

PLATE NO. = 3
0.73442704E+00 0.19873940E-01 0.25157920E+00

PLATE NO. = 4
0.84012483E+00 0.20250821E-02 0.16058014E+00

PLATE NO. = 5
0.91690810E+00 0.16693126E-03 0.83366850E-01

REFLUX
0.96821805E+00 0.83224702E-05 0.31770816E-01

TOP PRODUCT
0.96821805E+00 0.83224702E-05 0.31770816E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.19315163E+00 0.99997920E+00 0.92057296E+00

TOP PRODUCT RECOVERY FRACTIONS
0.80684837E+00 0.20806175E-04 0.79427040E-01

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.60000000E+02	0.11589098E+02	0.48410902E+02
2	0.20000000E+02	0.19999584E+02	0.41612391E-03
3	0.20000000E+02	0.18411459E+02	0.15885408E+01
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000028E+01	0.24924113E+03	0.12150000E+03	0.50000000E+02	0.19527436E+05	0.16735754E+05
0.10040765E+01	0.19791971E+03	0.12227156E+03	0.17150000E+03	0.16672659E+05	0.12824266E+05
0.10030789E+01	0.17819557E+03	0.13103021E+03	0.17227156E+03	0.15666618E+05	0.11493779E+05
0.10058802E+01	0.15751512E+03	0.14153332E+03	0.81030207E+02	0.14855601E+05	0.99664364E+04
0.10027308E+01	0.14790918E+03	0.14662158E+03	0.91533316E+02	0.14434492E+05	0.93664768E+04
0.10004419E+01	0.14193431E+03	0.15000000E+03	0.95621582E+02	0.14169795E+05	0.90165194E+04
0.99999718E+00	0.13814729E+03	0.00000000E+00	0.10000000E+03	0.00000000E+00	0.88025149E+04
0.99999718E+00	0.13814729E+03	0.00000000E+00	0.50000000E+02	0.00000000E+00	0.88025149E+04

CONDENSER LOAD = 0.80509201E+06

REBOILER LOAD = 0.89495761E+06

PHI = 0.97615279E+00

PROBLEM NO.

ITERATION NO. = 4

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.23241686E+00 0.39999141E+00 0.36767415E+00

PLATE NO. = 1
0.43060505E+00 0.19079733E+00 0.38099386E+00

PLATE NO. = 2
0.57192396E+00 0.13181286E+00 0.29363468E+00

PLATE NO. = 3
0.72797021E+00 0.20083671E-01 0.25337220E+00

PLATE NO. = 4
0.85587205E+00 0.20723889E-02 0.16277949E+00

PLATE NO. = 5
0.91497453E+00 0.17194496E-03 0.84789987E-01

REFLUX
0.96758314E+00 0.85870248E-05 0.32325850E-01

TOP PRODUCT
0.96758314E+00 0.85870248E-05 0.32325850E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.19368072E+00 0.99997853E+00 0.91918538E+00

TOP PRODUCT RECOVERY FRACTIONS
0.80631928E+00 0.21467562E-04 0.80814624E-01

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.60000000E+02	0.11620843E+02	0.48379157E+02
2	0.20000000E+02	0.19999571E+02	0.42935124E-03
3	0.20000000E+02	0.18383707E+02	0.16162925E+01
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000824E+01	0.24903471E+03	0.10935000E+03	0.50000000E+02	0.19510184E+05	0.16722494E+05
0.10023962E+01	0.19868303E+03	0.12428501E+03	0.12935000E+03	0.16703412E+05	0.12887731E+05
0.99737149E+00	0.17923499E+03	0.13092547E+03	0.17428501E+03	0.15708848E+05	0.11572142E+05
0.10014261E+01	0.15830333E+03	0.14125731E+03	0.18092546E+03	0.14891678E+05	0.10015482E+05
0.10007239E+01	0.14839831E+03	0.14644638E+03	0.21257311E+03	0.14457013E+05	0.93951667E+04
0.99993646E+00	0.14215666E+03	0.15000000E+03	0.96446881E+02	0.14179528E+05	0.90308881E+04
0.99991757E+00	0.13823294E+03	0.00000000E+00	0.10000000E+03	0.00000000E+00	0.88074835E+04
0.99991757E+00	0.13823294E+03	0.00000000E+00	0.50000000E+02	0.00000000E+00	0.88074835E+04

CONDENSER LOAD = 0.80580661E+06

REBOILER LOAD = 0.89525766E+06

PHI = 0.98589567E+00

1550557

PROBLEM NO,

ITERATION NO, = 5

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.23254416E+00 0.39999132E+00 0.36749258E+00

PLATE NO, = 1
0.42917167E+00 0.19104816E+00 0.38046447E+00

PLATE NO, = 2
0.57231634E+00 0.13267674E+00 0.29558981E+00

PLATE NO, = 3
0.72615376E+00 0.20227538E+01 0.25478691E+00

PLATE NO, = 4
0.83455421E+00 0.20932615E-02 0.16383031E+00

PLATE NO, = 5
0.91448746E+00 0.17396743E-03 0.85355022E-01

REFLUX
0.96745584E+00 0.86831583E-05 0.32507323E-01

TOP PRODUCT
0.96745584E+00 0.86831583E-05 0.32507323E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.19378680E+00 0.99997829E+00 0.91873159E+00

TOP PRODUCT RECOVERY FRACTIONS
0.80621320E+00 0.21707896E-04 0.81268307E-01

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.60000000E+02	0.11627208E+02	0.48372792E+02
2	0.20000000E+02	0.19999566E+02	0.43415791E-03
3	0.20000000E+02	0.18374634E+02	0.16253661E+01
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000282E+01	0.24392263E+03	0.10879592E+03	0.50000000E+02	0.19501109E+05	0.16715244E+05
0.10000843E+01	0.19995761E+03	0.12343201E+03	0.13879592E+03	0.16760964E+05	0.12986012E+05
0.10000829E+01	0.17945005E+03	0.13098535E+03	0.17343201E+03	0.15720170E+05	0.11585658E+05
0.10011602E+01	0.15859504E+03	0.14117474E+03	0.18985351E+02	0.14905603E+05	0.10033279E+05
0.10004878E+01	0.14861454E+03	0.14637068E+03	0.91174738E+02	0.14466745E+05	0.94075553E+04
0.10000164E+01	0.14225767E+03	0.15000000E+03	0.96370684E+02	0.14183671E+05	0.90374374E+04
0.99997185E+00	0.13827517E+03	0.00000000E+00	0.10000000E+03	0.00000000E+00	0.88098744E+04
0.99997185E+00	0.13827517E+03	0.00000000E+00	0.50000000E+02	0.00000000E+00	0.88098744E+04

CONDENSER LOAD = 0.80605956E+06

REBOILER LOAD = 0.89527763E+06

PHI = 0.99564297E+00

PROBLEM NO.

ITERATION NO. = 6

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.23256946E+00 0.39999129E+00 0.36744251E+00

PLATE NO. = 1
0.42869437E+00 0.19085423E+00 0.38033880E+00

PLATE NO. = 2
0.57200159E+00 0.13251186E+00 0.29564749E+00

PLATE NO. = 3
0.72522350E+00 0.20243983E-01 0.25503315E+00

PLATE NO. = 4
0.83404958E+00 0.20990279E-02 0.16413128E+00

PLATE NO. = 5
0.91438577E+00 0.17459372E-03 0.85530136E-01

REFLUX
0.96743054E+00 0.87111207E-05 0.32557393E-01

TOP PRODUCT
0.96743054E+00 0.87111207E-05 0.32557393E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.19380789E+00 0.99997822E+00 0.91860652E+00

TOP PRODUCT RECOVERY FRACTIONS
0.80619211E+00 0.21777802E-04 0.81393481E-01

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.60000000E+02	0.11628473E+02	0.48371527E+02
2	0.20000000E+02	0.19999564E+02	0.43555603E-03
3	0.20000000E+02	0.18372130E+02	0.16278696E+01
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000034E+01	0.24889974E+03	0.10908913E+03	0.50000000E+02	0.19499174E+05	0.16713876E+05
0.10000874E+01	0.20006587E+03	0.12371871E+03	0.10908913E+03	0.16767273E+05	0.12995591E+05
0.10001609E+01	0.17963176E+03	0.13094379E+03	0.12371871E+03	0.15729028E+05	0.11597684E+05
0.10005006E+01	0.15874922E+03	0.14110997E+03	0.80943789E+02	0.14912832E+05	0.10042525E+05
0.10002799E+01	0.14370825E+03	0.14633376E+03	0.91109970E+02	0.14470963E+05	0.94129185E+04
0.10000905E+01	0.14228895E+03	0.15000000E+03	0.96333764E+02	0.14185560E+05	0.90399463E+04
0.99999664E+00	0.13528911E+03	0.00000000E+00	0.10000000E+03	0.00000000E+00	0.88106553E+04
0.99999664E+00	0.13528911E+03	0.00000000E+00	0.50000000E+02	0.00000000E+00	0.88106553E+04

CONDENSER LOAD = 0.80920574E+06

REBOILER LOAD = 0.89538446E+06

PHI = 0.99949856E+00

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1000662

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CC - Resultados completos para o Exemplo III.1.C

Formato A 4 - 210x277 mm

INPUT DATA FOR PROB. NO. USING PROGRAM 1

NO. OF COMPONENTS	PLATES IN SECTION M	PLATES IN SECTION M1	PLATES IN SECTION M2	PLATES IN SECTION N
4	2	0	0	3

FEED FLOWS AND ENTHALPIES IN ORDER OF LOWEST ENTERING TO HIGHEST

MOLES FEED LIQUID	MOLES FEED VAPOR	ENTHALPY OF FEED LIQUID	ENTHALPY OF FEED VAPOR
0,10000000E+03	0,13150180E+07	0,00000000E+00	0,00000000E+00
0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00
0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00

COMPONENT FEED AMOUNTS

LOWEST FEED		INTERMEDIATE FEED		HIGHEST FEED	
LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
0,50000000E+02	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00
0,30000000E+02	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00
0,10000000E+02	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00
0,10000000E+02	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00	0,00000000E+00

EQUILIBRIUM CONSTANTS A	EQUILIBRIUM CONSTANTS B	EQUILIBRIUM CONSTANTS C	EQUILIBRIUM CONSTANTS D
-0,14512474E+00	0,53638924E-03	-0,53051604E-07	-0,17358329E-09
0,11506919E-01	-0,33885839E-03	0,97795400E-06	-0,54235941E-09
-0,14181715E+00	0,36866353E-03	0,16521412E-06	-0,24823843E-09
-0,18967651E+00	0,61239667E-03	-0,17891649E-06	-0,90855512E-10

ENTHALPY CONSTANTS A1	ENTHALPY CONSTANTS A2	ENTHALPY CONSTANTS A3	FOR LIQUID
-0,14500060E+02	0,19802223E+00	-0,29048837E-04	
-0,23870410E+02	0,26768089E+00	-0,44197793E-04	
-0,20298110E+02	0,23005743E+00	-0,38663417E-04	
-0,16553400E+02	0,21618650E+00	-0,31476209E-04	

ENTHALPY CONSTANTS A1	ENTHALPY CONSTANTS A2	ENTHALPY CONSTANTS A3	FOR VAPOR
0,81795910E+02	0,38981919E-01	0,36470900E-04	
0,85834950E+02	0,15223917E+00	-0,34018595E-04	
0,15266798E+03	-0,11534842E+00	0,14664125E-03	
0,14765440E+03	-0,11852942E+00	0,15287778E-03	

ERROR LIMIT ON PHI	ERROR LIMIT ON SUMMATION	ERROR LIMIT ON BUBBLE POINT
0,10000000E-03	0,10000000E-02	0,10000000E-03

TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS
0,19691834E+03	0,15000000E+03	0,50000000E+02
0,19691834E+03	0,15000000E+03	0,20000000E+03
0,19691834E+03	0,15000000E+03	0,20000000E+03
0,19691834E+03	0,15000000E+03	0,10000000E+03
0,19691834E+03	0,15000000E+03	0,10000000E+03
0,19691834E+03	0,15000000E+03	0,10000000E+03
0,19691834E+03	0,00000000E+00	0,10000000E+03
0,19691834E+03	0,00000000E+00	0,50000000E+02

OUTPUT WILL BE GIVEN FOR EVERY ITERATION

25055

PROBLEM NO,

ITERATION NO, = 1

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,12768572E+00 0,59985244E+00 0,15601482E+00 0,11652884E+00

PLATE NO, = 1
0,19896468E+00 0,20497483E+00 0,12041512E+00 0,10765865E+00

PLATE NO, = 2
0,29326402E+00 0,16876511E+00 0,10255990E+00 0,10261556E+00

PLATE NO, = 3
0,33749172E+00 0,32635960E-01 0,91744709E-01 0,10370577E+00

PLATE NO, = 4
0,39580748E+00 0,62570581E-02 0,77716981E-01 0,99893896E-01

PLATE NO, = 5
0,53508438E+00 0,11424524E-02 0,61851465E-01 0,93460830E-01

REFLUX
0,87231428E+00 0,14756576E-03 0,43985180E-01 0,83471165E-01

TOP PRODUCT
0,87231428E+00 0,14756576E-03 0,43985180E-01 0,83471165E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0,12768572E+00 0,99975406E+00 0,78007410E+00 0,58264418E+00

TOP PRODUCT RECOVERY FRACTIONS
0,87231428E+00 0,24594293E-03 0,21992590E+00 0,41735582E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,50000000E+02	0,63842858E+01	0,43615714E+02
2	0,30000000E+02	0,29992622E+02	0,73782860E-02
3	0,10000000E+02	0,78007410E+01	0,21992590E+01
4	0,10000000E+02	0,58264417E+01	0,41735582E+01
	0,99999999E+02	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000818E+01	0,19691834E+03	0,15000000E+03	0,50000000E+02	0,00000000E+00	0,00000000E+00
0,63201329E+00	0,19691834E+03	0,15000000E+03	0,20000000E+03	0,00000000E+00	0,00000000E+00
0,66720459E+00	0,19691834E+03	0,15000000E+03	0,20000000E+03	0,00000000E+00	0,00000000E+00
0,56557817E+00	0,19691834E+03	0,15000000E+03	0,10000000E+03	0,00000000E+00	0,00000000E+00
0,57967541E+00	0,19691834E+03	0,15000000E+03	0,10000000E+03	0,00000000E+00	0,00000000E+00
0,69153912E+00	0,19691834E+03	0,15000000E+03	0,10000000E+03	0,00000000E+00	0,00000000E+00
0,99991819E+00	0,19691834E+03	0,00000000E+00	0,10000000E+03	0,00000000E+00	0,00000000E+00
0,99991819E+00	0,19691834E+03	0,00000000E+00	0,50000000E+02	0,00000000E+00	0,00000000E+00

CONDENSER LOAD = 0,00000000E+00

REBOILER LOAD = 0,00000000E+00

PHI = 0,80293883E+00

32059

ITERATION NO, = 2

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,10923547E+00 0,59996848E+00 0,16673791E+00 0,12405944E+00

PLATE NO, = 1
0,25721481E+00 0,32658122E+00 0,21852715E+00 0,18943158E+00

PLATE NO, = 2
0,39823164E+00 0,20240823E+00 0,18185846E+00 0,18256007E+00

PLATE NO, = 3
0,55590195E+00 0,40805709E-01 0,18407098E+00 0,21600496E+00

PLATE NO, = 4
0,65892757E+00 0,50356809E-02 0,12995406E+00 0,18391263E+00

PLATE NO, = 5
0,76395940E+00 0,50535124E-03 0,75398216E-01 0,13156520E+00

REFLUX
0,89076454E+00 0,31518170E-04 0,33262092E-01 0,75940561E-01

TOP PRODUCT
0,89076454E+00 0,31518170E-04 0,33262092E-01 0,75940561E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0,10923547E+00 0,99994747E+00 0,83368954E+00 0,62029720E+00

TOP PRODUCT RECOVERY FRACTIONS
0,89076453E+00 0,52530283E-04 0,16631046E+00 0,37970281E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,50000000E+02	0,54617732E+01	0,44538227E+02
2	0,30000000E+02	0,29998424E+02	0,15759085E-02
3	0,10000000E+02	0,83368954E+01	0,16631046E+01
4	0,10000000E+02	0,62029719E+01	0,37970280E+01
	0,99999999E+02	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000013E+01	0,29336462E+03	0,13500000E+03	0,50000000E+02	0,22652270E+05	0,20356665E+05
0,99175475E+00	0,22222514E+03	0,13600085E+03	0,18500000E+03	0,17851005E+05	0,14773827E+05
0,96505840E+00	0,19965162E+03	0,14000000E+03	0,18600085E+03	0,16597890E+05	0,13162296E+05
0,99686368E+00	0,16932724E+03	0,14715199E+03	0,90000000E+02	0,15421576E+05	0,10757980E+05
0,97782994E+00	0,15921441E+03	0,15012725E+03	0,97151989E+02	0,15006242E+05	0,10033187E+05
0,97142816E+00	0,15344810E+03	0,15000000E+03	0,10012725E+03	0,14733387E+05	0,95705655E+04
0,99999871E+00	0,14436337E+03	0,00000000E+00	0,10000000E+03	0,00000000E+00	0,91543660E+04
0,99999871E+00	0,14436337E+03	0,00000000E+00	0,50000000E+02	0,00000000E+00	0,91543660E+04

CONDENSER LOAD = 0,83685322E+06

REBOILER LOAD = 0,99738679E+06

PHI = 0,92428415E+00

27063

PROBLEM NO; 3

ITERATION NO, = 3

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,11267306E+00 0,99996510E+00 0,16506804E+00 0;12229773E+00

PLATE NO, = 1
0,26140034E+00 0,34025481E+00 0,21823371E+00 0;18711570E+00

PLATE NO, = 2
0,40969304E+00 0,22012638E+00 0,18952619E+00 0;18664856E+00

PLATE NO, = 3
0,55305886E+00 0,45158586E-01 0,19344123E+00 0;22070538E+00

PLATE NO, = 4
0,66696129E+00 0,58686380E-02 0,14126739E+00 0;19368300E+00

PLATE NO, = 5
0,77945225E+00 0,59373180E-03 0,82456880E-01 0;13953236E+00

REFLUX
0,88732694E+00 0,34895566E-04 0,34931959E-01 0;77702270E-01

TOP PRODUCT
0,88732694E+00 0,34895566E-04 0,34931959E-01 0;77702270E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11267306E+00 0,99994184E+00 0,82534021E+00 0;61148865E+00

TOP PRODUCT RECOVERY FRACTIONS
0,88732694E+00 0,58159277E-04 0,17465979E+00 0;38851135E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,50000000E+02	0,56336529E+01	0,44366347E+02
2	0,30000000E+02	0,29998255E+02	0,17447783E-02
3	0,10000000E+02	0,82534020E+01	0,17465979E+01
4	0,10000000E+02	0,61148865E+01	0,38851135E+01
	0,99999999E+02	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000039E+01	0,29716334E+03	0,12150000E+03	0,50000000E+02	0,23058294E+05	0,20616035E+05
0,10070046E+01	0,23044177E+03	0,12240076E+03	0,17150000E+03	0,18442173E+05	0,15300355E+05
0,10059942E+01	0,19990668E+03	0,13100000E+03	0,17240076E+03	0,16703128E+05	0,12977457E+05
0,10123640E+01	0,17162900E+03	0,14034794E+03	0,81000000E+02	0,15598356E+05	0,10838983E+05
0,10077803E+01	0,15947626E+03	0,14598761E+03	0,90347935E+02	0,15036970E+05	0,10030853E+05
0,10020352E+01	0,15072858E+03	0,15000000E+03	0,95987614E+02	0,14605208E+05	0,95041558E+04
0,99999607E+00	0,14303487E+03	0,00000000E+00	0;10000000E+03	0,00000000E+00	0,90785105E+04
0,99999607E+00	0,14303487E+03	0,00000000E+00	0;50000000E+02	0,00000000E+00	0,90785105E+04

CONDENSER LOAD = 0,82900460E+06

REBOILER LOAD = 0,99871390E+06

PHI = 0,96528053E+00

290C3

PROBLEM NO;

ITERATION NO, = 4

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,11504429E+00 0,59996085E+00 0,16385472E+00 0,12114384E+00

PLATE NO, = 1
0,26073979E+00 0,34739920E+00 0,21420963E+00 0,18258459E+00

PLATE NO, = 2
0,40570818E+00 0,22766745E+00 0,18718548E+00 0,18250355E+00

PLATE NO, = 3
0,54326245E+00 0,48605552E-01 0,19569392E+00 0,21941964E+00

PLATE NO, = 4
0,65839637E+00 0,64389018E-02 0,14435728E+00 0,19422976E+00

PLATE NO, = 5
0,77451371E+00 0,66218264E-03 0,85033895E-01 0,14111362E+00

REFLUX
0,88495571E+00 0,39152426E-04 0,36145284E-01 0,78856159E-01

TOP PRODUCT
0,88495571E+00 0,39152426E-04 0,36145284E-01 0,78856159E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11504429E+00 0,99993475E+00 0,81927358E+00 0,60571920E+00

TOP PRODUCT RECOVERY FRACTIONS
0,88495571E+00 0,65254044E-04 0,18072642E+00 0,39428080E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,50000000E+02	0,57522145E+01	0,44247785E+02
2	0,30000000E+02	0,29998042E+02	0,19576213E-02
3	0,10000000E+02	0,81927358E+01	0,18072642E+01
4	0,10000000E+02	0,60571920E+01	0,39428080E+01
	0,99999999E+02	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000037E+01	0,29647950E+03	0,10935000E+03	0,50000000E+02	0,22983499E+05	0,20559259E+05
0,10049332E+01	0,23142903E+03	0,11595804E+03	0,15935000E+03	0,18479968E+05	0,15391427E+05
0,10030647E+01	0,20034691E+03	0,12654242E+03	0,16595804E+03	0,16763104E+05	0,13093304E+05
0,10069816E+01	0,17292729E+03	0,14014643E+03	0,76542419E+02	0,15660643E+05	0,10925498E+05
0,10034223E+01	0,16051913E+03	0,14551803E+03	0,90146426E+02	0,15089382E+05	0,10092507E+05
0,10013234E+01	0,15119879E+03	0,15000000E+03	0,95618027E+02	0,14627868E+05	0,95411541E+04
0,99999630E+00	0,14326936E+03	0,00000000E+00	0,10000000E+03	0,00000000E+00	0,90920050E+04
0,99999630E+00	0,14326936E+03	0,00000000E+00	0,50000000E+02	0,00000000E+00	0,90920050E+04

CONDENSER LOAD = 0,83037945E+06

REBOILER LOAD = 0,99842469E+06

PHI = 0,97479096E+00

PROBLEM NO,

ITERATION NO, = 5

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,11578607E+00 0,59995975E+00 0,16350270E+00 0,12083039E+00

PLATE NO, = 1
0,25684398E+00 0,35393385E+00 0,21171170E+00 0,17970757E+00

PLATE NO, = 2
0,40248302E+00 0,22698316E+00 0,18647155E+00 0,18111420E+00

PLATE NO, = 3
0,53808041E+00 0,48978095E-01 0,19567900E+00 0,21817566E+00

PLATE NO, = 4
0,65455566E+00 0,65659985E-02 0,14524121E+00 0,19421016E+00

PLATE NO, = 5
0,77203639E+00 0,57897210E-03 0,85760644E-01 0,14145410E+00

REFLUX
0,88421393E+00 0,40253715E-04 0,36497302E-01 0,79169609E-01

TOP PRODUCT
0,88421393E+00 0,40253715E-04 0,36497302E-01 0,79169609E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11578607E+00 0,99993291E+00 0,81751349E+00 0,60415196E+00

TOP PRODUCT RECOVERY FRACTIONS
0,88421393E+00 0,67089525E-04 0,18248651E+00 0,39584804E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,50000000E+02	0,57893037E+01	0,44210696E+02
2	0,30000000E+02	0,29997987E+02	0,20126857E-02
3	0,10000000E+02	0,81751349E+01	0,18248651E+01
4	0,10000000E+02	0,60415196E+01	0,39584804E+01
	0,99999999E+02	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000789E+01	0,29599884E+03	0,99976605E+02	0,50000000E+02	0,22931655E+05	0,20536499E+05
0,10021971E+01	0,23238061E+03	0,11819423E+03	0,14997660E+03	0,18518175E+05	0,15477475E+05
0,99705202E+00	0,20140526E+03	0,12675770E+03	0,16819423E+03	0,16802152E+05	0,13183399E+05
0,10009132E+01	0,17381030E+03	0,13990975E+03	0,76757700E+02	0,15699971E+05	0,10988009E+05
0,10005730E+01	0,16102234E+03	0,14555512E+03	0,89909747E+02	0,15114384E+05	0,10123387E+05
0,99993010E+00	0,15152432E+03	0,15000000E+03	0,95555117E+02	0,14643635E+05	0,95608501E+04
0,99992109E+00	0,14343799E+03	0,00000000E+00	0,10000000E+03	0,00000000E+00	0,91015744E+04
0,99992109E+00	0,14343799E+03	0,00000000E+00	0,50000000E+02	0,00000000E+00	0,91015744E+04

CONDENSER LOAD = 0,83130908E+06

REBOILER LOAD = 0,99819476E+06

PHI = 0,98707090E+00

32057

PROBLEM NO,

ITERATION NO, = 6

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,11584265E+00 0,59995954E+00 0,16343899E+00 0,12076581E+00

PLATE NO, = 1
0,25707520E+00 0,35165710E+00 0,21172328E+00 0,17969071E+00

PLATE NO, = 2
0,40342306E+00 0,22855179E+00 0,18772536E+00 0,18202389E+00

PLATE NO, = 3
0,53713159E+00 0,49255856E-01 0,19648419E+00 0,21858821E+00

PLATE NO, = 4
0,65372575E+00 0,66078204E-02 0,14578021E+00 0,19455804E+00

PLATE NO, = 5
0,77168259E+00 0,68347324E-03 0,36033312E-01 0,14169280E+00

REFLUX
0,88415735E+00 0,40463478E-04 0,36561013E-01 0,79234188E-01

TOP PRODUCT
0,88415735E+00 0,40463478E-04 0,36561013E-01 0,79234188E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11584265E+00 0,99993256E+00 0,81719494E+00 0,60382906E+00

TOP PRODUCT RECOVERY FRACTIONS
0,88415735E+00 0,67439130E-04 0,18280506E+00 0,39617094E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,50000000E+02	0,57921325E+01	0,44207867E+02
2	0,30000000E+02	0,29997977E+02	0,20231739E-02
3	0,10000000E+02	0,81719493E+01	0,18280506E+01
4	0,10000000E+02	0,60382906E+01	0,39617094E+01
	0,99999999E+02	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000070E+01	0,29583854E+03	0,10251420E+03	0,50000000E+02	0,22914900E+05	0,20525446E+05
0,10001463E+01	0,23374452E+03	0,11705690E+03	0,15251420E+03	0,18589595E+05	0,15588088E+05
0,10017241E+01	0,20156300E+03	0,12684406E+03	0,16705690E+03	0,16809898E+05	0,13195160E+05
0,10014598E+01	0,17403270E+03	0,13937094E+03	0,76844061E+02	0,15710740E+05	0,11003060E+05
0,10006718E+01	0,16120367E+03	0,14549062E+03	0,89870938E+02	0,15123303E+05	0,10134089E+05
0,10000922E+01	0,15161312E+03	0,15000000E+03	0,95490623E+02	0,14647691E+05	0,95672529E+04
0,99999301E+00	0,14348836E+03	0,00000000E+00	0,10000000E+03	0,00000000E+00	0,91043779E+04
0,99999301E+00	0,14348836E+03	0,00000000E+00	0,50000000E+02	0,00000000E+00	0,91043779E+04

CONDENSER LOAD = 0,83149695E+06

REBOILER LOAD = 0,99797019E+06

PHI = 0,99898353E+00

22966

PROBLEM NO,

ITERATION NO, = 7

LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,11587947E+00 0,59995945E+00 0,16340503E+00 0,12072974E+00

PLATE NO, = 1
0,25687277E+00 0,35202117E+00 0,21159539E+00 0,17952656E+00

PLATE NO, = 2
0,40290810E+00 0,22775631E+00 0,18734234E+00 0,18165285E+00

PLATE NO, = 3
0,53642099E+00 0,49190576E+01 0,19628952E+00 0,21830071E+00

PLATE NO, = 4
0,65327473E+00 0,66133915E-02 0,14581662E+00 0,19451396E+00

PLATE NO, = 5
0,77156744E+00 0,68488160E-03 0,86114857E-01 0,14175437E+00

REFLUX
0,88412053E+00 0,40548419E-04 0,36594973E-01 0,79270265E-01

TOP PRODUCT
0,88412053E+00 0,40548419E-04 0,36594973E-01 0,79270265E-01

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11587947E+00 0,99993242E+00 0,81702514E+00 0,60364868E+00

TOP PRODUCT RECOVERY FRACTIONS
0,88412053E+00 0,67580699E-04 0,18297486E+00 0,39635132E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,50000000E+02	0,57939735E+01	0,44206026E+02
2	0,30000000E+02	0,29997972E+02	0,20274210E-02
3	0,10000000E+02	0,81702513E+01	0,18297486E+01
4	0,10000000E+02	0,60364867E+01	0,39635132E+01
	0,99999999E+02	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,99997368E+00	0,29583854E+03	0,10205699E+03	0,50000000E+02	0,22914286E+05	0,20525540E+05
0,10000159E+01	0,23345621E+03	0,11777026E+03	0,15205699E+03	0,18573961E+05	0,15564656E+05
0,99965961E+00	0,20171971E+03	0,12680140E+03	0,16777026E+03	0,16818211E+05	0,13206225E+05
0,10002018E+01	0,17416726E+03	0,13980013E+03	0,76801396E+02	0,15717598E+05	0,11011601E+05
0,10002187E+01	0,16128289E+03	0,14545013E+03	0,89800130E+02	0,15127288E+05	0,10138693E+05
0,10001215E+01	0,15162949E+03	0,15000000E+03	0,95450129E+02	0,14648838E+05	0,95693922E+04
0,10000263E+01	0,14348836E+03	0,00000000E+00	0,10000000E+03	0,00000000E+00	0,91045938E+04
0,10000263E+01	0,14348836E+03	0,00000000E+00	0,50000000E+02	0,00000000E+00	0,91045938E+04

CONDENSER LOAD = 0,83163662E+06

REBOILER LOAD = 0,99812534E+06

PHI = 0,10000000E+01

32071

***ERR 10132 DSC

220078

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 FORTRAN IV, CD225H6,004,    JUL   1967
$JOB      NOLIST,NOCARDS
$PAUSE
CARDS REMAINING IN DECK ARE--
MAY 18 68      16 09.7
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320072

APÊNDICE D

APÊNDICE D

RESULTADOS DOS PROGRAMAS PARA REGIME NÃO PERMANENTE: EXEMPLO III.2.A

ÍNDICE

	Página
DA - Resultados Parciais para o Método de Euler, Δt=0,1 min.	D 1
DB - Resultados Parciais para o Método de Euler, Δt=0,2 min.	D 30
DC - Resultados Parciais para o Método de Euler, Δt=0,25 min.	D 60
DD - Resultados Completos para o Método de Runge-Kutta, Δt=0,1 min.	D 81
DE - Resultados Completos para o Método θ de Convergência, Δt Variável	D127
DF - Resultados Parciais do Simulador Leans, Δt=0,2 min.	D142

DA - Resultados parciais para o Método de Euler,

$\Delta t = 0,1$ min.

INPUT DATA DYNAMIC DISTILLATION HOLLANDS METHOD

NO. OF COMPONENTS	STRIPPING PLATES	RECTIFYING PLATES	REFERENCE COMPONENT
5	1	2	

LIQUID FEED RATE = 9.99999996E+01 VAPOR FEED RATE = 0.00000000E-01 FEED TEMPERATURE = 0.00000000E-01

LIQUID FEED COMPOSITION	VAPOR FEED COMPOSITION	BY COMPONENT
1.[illegible]E-01	0.00000000E-01	1
4.16699999E-01	0.00000000E-01	2
4.16[illegible]E-01	0.00000000E-01	3

TRAY	TEMPERATURE	VAPOR FLOW RATE	LIQUID FLOW RATE	HOLD UP
-1	0.00000E+00	0.00000000E-01	0.00000000E-01	0.00000000E-01
0	1.00000E+00	9.99999998E+01	4.99999998E+01	4.99999998E+01
1	1.00000E+00	9.99999998E+01	4.99999998E+01	4.99999998E+01
2	1.00000E+00	9.99999998E+01	4.99999998E+01	4.99999998E+01
3	1.00000E+00	9.99999998E+01	4.99999998E+01	4.99999998E+01
4	1.00000E+00	9.99999998E+01	4.99999998E+01	4.99999998E+01
5	0.00000E+00	0.00000000E-01	0.00000000E-01	0.00000000E-01

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
-1	1.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
0	0.11070800	0.11070800	0.36151400	0.36151400	0.52777700	0.52777700		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
1	0.2455[illegible]400	0.11070800	0.36[illegible]600	0.36151400	0.37[illegible]300	0.52777700		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
2	0.36972800	0.17378700	0.36548000	0.37412500	0.26458800	0.45208800		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
3	0.41868800	0.23194700	0.35764400	0.39027900	0.22368400	0.37177300		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
4	0.35529000	0.25035500	0.36446400	0.38422500	0.14022200	0.36541700		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
5	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000		

EQUILIBRIUM CONSTANTS	COMP.	A1	A2	A3	A4
	1	9.99999998E-01	1.00000000E-01	0.00000000E-01	0.00000000E-01
	2	9.00000000E+00	1.00000000E-01	0.00000000E-01	0.00000000E-01
	3	9.99999998E+01	1.00000000E-01	0.00000000E-01	0.00000000E-01

LIQUID ENTHALPY CONSTANTS	COMP.	C1	C2	C3	C4
	1	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

69014

	2	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
	3	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

D3

VAPOR ENTHALPY CONSTANTS	COMP.	E1	E2	E3	E4
	1	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
	2	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
	3	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

KB BY TRAY

0.07200000
0.41572400
0.46732100
0.51154200
0.55401100
0.63094200
0.00000000

69015



cm 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
unesp

FOR THIS RUN DELT = 0.10001

A,SLO,GSL,SVO,SLO,J,I	0.000000	5.535400	49.999350	5.535400	5.535401	2	1
0.000000	18.075700	49.999950	18.075700	18.075700	2	2	
0.000000	25.383850	49.999950	25.383850	25.383850	2	3	
0.000000	11.843210	49.999915	11.670300	11.843200	3	1	
-0.000000	19.336800	49.999915	36.151400	19.336800	3	2	
0.000000	13.813205	49.999915	32.277699	13.813200	3	3	
-10.000000	15.523400	49.999840	17.378700	51.952200	4	1	
0.000000	19.121020	49.999840	37.412500	54.952000	4	2	
0.000000	19.555420	49.999840	45.208300	44.184200	4	3	
-0.000000	20.933320	49.999769	23.194700	62.300200	5	1	
-0.000000	17.532200	49.999769	39.527900	53.046600	5	2	
-0.000000	11.184200	49.999769	37.177500	55.252600	5	3	

69012

PROBLEM NO.
TIME = 0.1000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.55525254E+00 0.30448514E+00 0.14022222E+00

PLATE NO. = 1
0.41636756E+00 0.35764550E+00 0.22598494E+00

PLATE NO. = 2
0.30645329E+00 0.38242162E+00 0.31110490E+00

PLATE NO. = 3
0.25586440E+00 0.38573666E+00 0.37639874E+00

REFLUX
0.11107081IE+00 0.36151456E+00 0.52777758E+00

TOP PRODUCT
0.11107081E+00 0.36151456E+00 0.52777753E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13653446E+01 0.59235294E+00 0.16822552E+00

TOP PRODUCT RECOVERY FRACTIONS
0.55205792E+00 0.45374203E+00 0.53434350E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.14976127E+01 0.79913547E+00 0.80172797E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1497700 0E+02	0.27754632E+02	0.5555400 0E+01
2	0.4197700 0E+02	0.15224257E+02	0.1807571 3E+02
3	0.4135000 0E+02	0.7011110 0E+01	0.2653387 0E+02
	0.1000000 0E+03	0.5000000 0E+02	0.5000000 0E+02

PLATE VARIABLES

STATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000 0E+01	0.1000000 0E+01	0.5000000 0E+02	0.5000000 0E+02				
0.1000000 0E+01	0.1000000 0E+01	0.1000000 0E+03	0.5000000 0E+02				
0.1000000 0E+01	0.1000000 0E+01	0.1000000 0E+03	0.1500000 0E+03				
0.1000000 0E+01	0.1000000 0E+01	0.1000000 0E+03	0.1500000 0E+03				
0.1000000 0E+01	0.1000000 0E+01	0.1000000 0E+03	0.5000000 0E+02				
ANSWER, STATIONS, SCRIPT	0.000033	5.535404	49.999950	5.535405	5.535404	2	1
0.1000047	19.075705	49.999930	19.075718	18.075718	2	2	
-1.1000035	25.555841	49.999930	24.588876	26.588876	2	3	
-2.1000036	11.434140	49.999915	11.070849	11.443250	3	1	
1.7410040	19.410004	49.999915	56.151483	12.535835	3	2	
1.5420054	19.954870	49.999915	52.777068	18.919987	3	3	
-1.3551033	14.554670	49.999859	15.247774	45.771547	4	1	
3.1179224	19.432312	49.999859	59.153153	57.565245	4	2	
1.1332579	19.995558	49.999859	46.553584	46.955409	4	3	
-1.1000036	20.434441	49.999789	23.134792	52.101434	5	1	
2.2110930	19.133999	49.999789	57.527775	55.554825	5	2	
2.1738035	11.432109	49.999789	57.177235	55.252741	5	3	

69015

69010

PROBLEM NO.
TIME = 0.200 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.56529256E+00 0.30418619E+00 0.14022216E+00

PLATE NO. = 1
0.43859136E+00 0.36246750E+00 0.22854116E+00

PLATE NO. = 2
0.23756831E+00 0.39265750E+00 0.31977418E+00

PLATE NO. = 3
0.12625820E+00 0.38421874E+00 0.37910306E+00

REFLUX
0.11070814E+00 0.36161446E+00 0.52777736E+00

TOP PRODUCT
0.11070814E+00 0.36161446E+00 0.52777736E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.10625644E+01 0.36535500E+00 0.16829521E+00

TOP PRODUCT RECOVERY FRACTIONS
0.33279815E+00 0.43378264E+00 0.63343418E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13978038E+01 0.79913594E+00 0.80172769E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15970000E+02	0.9279466E+02	0.6555340E+01
2	0.41970000E+02	0.15224259E+02	0.18076723E+02
3	0.41560000E+02	0.7014107E+01	0.26533859E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

ERRORS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,SUD,SSD,SVD,SLD,DI	+0.230267	2.512377	49.999950	5.535409	5.535409	2	1
0.122248	18.077229	49.999950	18.076723	18.076723		2	2
0.250822	25.407343	49.999950	25.388868	25.388868		2	3
-2.401376	11.354103	49.999914	12.540351	11.051160		3	1
1.126967	19.523491	49.999914	36.173691	19.410937		3	2
1.097439	13.122311	49.999914	32.233757	18.354903		3	3
-5.482525	13.720887	49.999839	14.137926	45.109247		4	1
3.401110	19.272525	49.999839	38.535472	58.093626		4	2
3.381725	15.536329	49.999839	47.226201	47.496127		4	3
-2.212047	19.372237	49.999750	22.455168	61.306702		5	1
1.699332	18.432157	49.999750	39.954671	54.401126		5	2
2.052466	11.637235	49.999750	37.582141	54.295172		5	3

PROBLEM NO.
TIME = 0.5000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.5522991E+00 0.3059218E+00 0.1417889E+00

PLATE NO. = 1
0.3974635E+00 0.3688029E+00 0.2337341E+00

PLATE NO. = 2
0.2744028E+00 0.3924597E+00 0.3261375E+00

PLATE NO. = 3
0.2271434E+00 0.3904726E+00 0.3824439E+00

REFLUX
0.1102476E+00 0.3616595E+00 0.5281929E+00

TOP PRODUCT
0.1102476E+00 0.3616595E+00 0.5281929E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1056556E+01 0.3671001E+00 0.1700700E+00

TOP PRODUCT RECOVERY FRACTIONS
0.8305768E+00 0.4338603E+00 0.5339351E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1487211E+01 1.8009654E+00 0.8040117E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1497000E+02	0.2741496E+02	0.5512826E+01
2	0.4197000E+02	0.1527259E+02	0.1807794E+02
3	0.4106000E+02	0.7082440E+01	0.2698957E+02
	0.1000000E+03	0.5000000E+02	0.5000000E+02

PLATE VARIABLES

STAGES	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000E+01	0.1100000E+01	0.2000000E+02	0.5000000E+02				
0.2000000E+01	0.1100000E+01	0.1000000E+03	0.1500000E+03				
0.3000000E+01	0.1100000E+01	0.1000000E+03	0.1500000E+03				
0.4000000E+01	0.1100000E+01	0.1000000E+03	0.1500000E+03				
0.5000000E+01	0.1100000E+01	0.1000000E+03	0.5000000E+02				
A,S,D,S,S,D,S,D,S,D,I	-0.449151	5.465159	40.077951	5.512383	5.512383	2	1
0.197218	13.035600	49.989820	18.077947	18.077947	2	2	
0.412475	25.450991	49.989820	25.499670	25.499670	2	3	
-3.305819	11.353598	49.989814	11.353584	11.551022	3	1	
1.207458	19.547514	49.989814	36.232503	19.525634	3	2	
1.742611	13.290372	49.989814	53.251413	19.122344	3	3	
-4.355194	15.353159	49.989839	15.374175	41.251393	4	1	
2.358469	21.225511	49.989839	38.268727	20.418952	4	2	
2.362524	15.543152	49.989839	47.537193	18.921645	4	3	
-3.355312	13.457356	49.989749	21.544032	20.418041	5	1	
2.358423	19.733119	49.989749	40.167224	18.920944	5	2	
2.411672	11.322104	49.989749	59.187224	15.861915	5	3	

6901.1

69008

PROBLEM NO.
TIME = 0.4000E+000 MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.9468072+E+00 0.5021250BE+00 0.1441502+E+00

PLATE NO. = 1
0.8674598E+00 0.3744699+E+00 0.2385R504E+00

PLATE NO. = 2
0.2549702DE+00 0.4044675DE+00 0.3508625DE+00

PLATE NO. = 3
0.2210744+E+00 0.3929935+E+00 0.3859321[E+00

REFLUX
0.1392642+E+00 0.3612125+E+00 0.5290133+E+00

TOP PRODUCT
0.1392642+E+00 0.3612125+E+00 0.5290133+E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1940025+E+01 0.5718004+E+00 0.1730230+E+00

TOP PRODUCT RECOVERY FRACTIONS
0.8277425+E+00 0.4819201+E+00 0.4842255[E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1367858+E+01 0.3043205+E+00 0.8172615+E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1557701DE+02	0.2754039+E+02	0.2463454+E+01
2	0.4197010DE+02	0.1549125+E+02	0.1803661+E+02
3	0.4154000DE+02	0.7206349[E+01	0.2645191+E+02
	0.1000000DE+03	0.5000000DE+02	0.5000000DE+02

PLATE VARIABLES

SIMMERING	TEMPERATURES		VAPOR FLOWS		LIQUID FLOWS		VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000E+01	0.1000000E+01		0.5000000E+02		0.5000000E+02					
0.1000000E+01	0.1000000E+01		0.1000000E+03		0.5000000E+02					
0.1000000E+01	0.1000000E+01		0.1000000E+03		0.1500000E+03					
0.1000000E+01	0.1000000E+01		0.1000000E+03		0.1500000E+03					
0.1000000E+01	0.1000000E+01		0.1000000E+03		0.5000000E+02					
AZEOTROPE	+0.7[4472		2.331252		19.999949		5.463464	5.463464	2	1
1.236414	18.099140	49.999949	13.995918		18.883618					
1.377559	25.511145	49.999949	25.450917		25.450917		2	3		
-2.992645	10.754155	49.999914	10.211456		11.355717		3	1		
1.240517	12.777,75	49.999914	56.535640		12.942678		3	2		
1.712357	13.457486	49.999914	53.441405		13.286505		3	3		
-3.701665	13.845251	49.999859	12.909564		59.700550		4	1		
1.206236	20.412535	49.999859	32.151107		60.071125		4	2		
1.258014	15.755325	49.999859	48.134429		49.522344		4	3		
-4.494027	13.841364	49.999789	20.333913		98.012043		5	1		
2.323451	17.115112	49.999789	40.443701		99.201404		5	2		
2.267026	17.159315	49.999789	58.233787		99.787402		5	3		

69009

PROBLEM ID.
TIME = 0.5000[0000 MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.[illegible]E+00 0.5151[illegible]E+00 0.1471[illegible]E+00

PLATE ID. = 1
0.[illegible]E+00 0.[illegible]E+00 0.[illegible]E+01

PLATE ID. = 2
0.[illegible]E+00 0.[illegible]E+00 0.[illegible]E+00

PLATE ID. = 3
0.[illegible]E+00 0.[illegible]E+00 0.[illegible]E+00

REFLUX
0.[illegible]E+00 0.[illegible]E+00 0.[illegible]E+00

TOP PRODUCT
0.[illegible]E+00 0.[illegible]E+00 0.[illegible]E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.[illegible]E+01 0.[illegible]E+00 0.[illegible]E+00

TOP PRODUCT RECOVERY FRACTIONS
0.[illegible]E+00 0.[illegible]E+00 0.[illegible]E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.[illegible]E+01 0.[illegible]E+00 0.[illegible]E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.[illegible]E+02	0.[illegible]E+02	0.[illegible]E+01
2	0.[illegible]E+02	0.[illegible]E+02	0.[illegible]E+02
3	0.[illegible]E+02	0.[illegible]E+01	0.[illegible]E+02
	0.[illegible]E+03	0.[illegible]E+02	0.[illegible]E+02

PLATE VARIABLES

STAGES	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.[illegible]E+01	1.[illegible]E+01	0.[illegible]E+02	0.[illegible]E+02				
0.[illegible]E+01	1.[illegible]E+01	0.[illegible]E+03	0.[illegible]E+02				
0.[illegible]E+01	1.[illegible]E+01	0.[illegible]E+03	0.[illegible]E+03				
0.[illegible]E+01	1.[illegible]E+01	0.[illegible]E+03	0.[illegible]E+03				
0.[illegible]E+01	1.[illegible]E+01	0.[illegible]E+03	0.[illegible]E+02				
A,SUU,SSS,S7U,SCU7J.I	-0.[illegible]	5.[illegible]	19.[illegible]	5.[illegible]	5.[illegible]	2	1
0.[illegible]	14.[illegible]	49.[illegible]	14.[illegible]	18.[illegible]		2	2
0.[illegible]	26.[illegible]	49.[illegible]	24.[illegible]	26.[illegible]		2	3
-2.[illegible]	11.[illegible]	49.[illegible]	9.[illegible]	15.[illegible]		3	1
1.[illegible]	19.[illegible]	49.[illegible]	56.[illegible]	19.[illegible]		3	2
1.[illegible]	31.[illegible]	49.[illegible]	53.[illegible]	31.[illegible]		3	3
-3.[illegible]	23.[illegible]	49.[illegible]	23.[illegible]	33.[illegible]		4	1
1.[illegible]	20.[illegible]	49.[illegible]	39.[illegible]	51.[illegible]		4	2
1.[illegible]	14.[illegible]	49.[illegible]	48.[illegible]	51.[illegible]		4	3
-3.[illegible]	19.[illegible]	49.[illegible]	20.[illegible]	33.[illegible]		5	1
2.[illegible]	19.[illegible]	49.[illegible]	40.[illegible]	37.[illegible]		5	2
2.[illegible]	12.[illegible]	49.[illegible]	39.[illegible]	36.[illegible]		5	3

69006

PROBLEM ID.
TIME = 0.4000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.5512617E+00 0.5179244?E+00 0.1204551?E+00

PLATE ID. = 1
0.3679944?E+00 0.3851249?E+00 0.2473796?E+00

PLATE ID. = 2
0.2503128?E+00 0.4116119?E+00 0.3380753?E+00

PLATE ID. = 3
0.2195030?E+00 0.3961446?E+00 0.3926522?E+00

REFLUX
0.1196156?E+00 0.3623566?E+00 0.5315599?E+00

TOP PRODUCT
0.1196156?E+00 0.3623566?E+00 0.5315599?E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1?9?3552E+01 0.3?147?85E+00 0.1?057?59E+00

TOP PRODUCT RECOVERY FRACTIONS
0.?.?10?63E+00 0.434795?HE+00 0.?3?0??40E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1?1?53?2E+01 0.?16?7202E+00 0.?1?3?3?2E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1697?010E+02	0.?9?0?6?3E+02	0.?3?3?917E+01
2	0.4197?010E+02	0.1?8?622?4E+02	0.1?117?32E+02
3	0.4198?010E+02	0.7?2?9?40E+01	0.?6?7?347E+02
	0.1000000?0E+03	0.?000000?E+02	0.?000?000E+02

PLATE VARIABLES

SIMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1?0000?0E+01	0.1?0000?0E+01	0.?00000?0E+02	0.?00000?0E+02				
0.1?0000?0E+01	0.1?0000?0E+01	0.1?0000?0E+03	0.?00000?0E+02				
0.1?0000?0E+01	0.1?0000?0E+01	0.1?0000?0E+03	0.1?0000?0E+03				
0.1?0000?0E+01	0.1?0000?0E+01	0.1?0000?0E+03	0.1?0000?0E+03				
0.1?0000?0E+01	0.1?0000?0E+01	0.1?0000?0E+03	0.?00000?0E+02				
A?SUD.$$0.S?0,SLO?D,I	-1.019313	5.200885	49.999949	5.302822	5.302422	2	1
3.?26181	18.140131	49.999949	18.117832	18.117832	2	2	
3.?951?2	24.456533	49.999949	24.579347	26.379347	2	3	
-2.?5?1?5	10.139?22	49.999914	9.586331	10.466153	3	1	
1.154452	20.020566	49.999914	34.461344	19.902254	3	2	
1.374474	19.790126	49.999914	33.?61325	19.?32612	3	3	
-2.345?84	12.?31?13	49.999?39	11.?49525	37.?46925	4	1	
1.564477	20.?16?74	49.999?39	39.4?0?08	61.?41778	4	2	
1.4514?6	17.?51852	49.999?39	45.579565	50.?11297	4	3	
-1.?08?67	12.648?67	49.999?99	10.?55414	53.139?63	5	1	
2.?01151	19.481?50	49.999?99	40.964930	57.?53?38	5	2	
2.107?15	12.?59553	49.999?99	32.479656	37.106499	5	3	

69007

PROBLEM NO.
TIME = 0.7000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.52305635E+00 0.32308344E+00 0.15386021E+00

PLATE NO. = 1
0.35899065E+00 0.36962724E+00 0.25138211E+00

PLATE NO. = 2
0.24562105E+00 0.41434082E+00 0.34103813E+00

PLATE NO. = 3
0.20327479E+00 0.40041401E+00 0.39631120E+00

REFLUX
0.10401781E+00 0.36280899E+00 0.53317320E+00

TOP PRODUCT
0.10401781E+00 0.36280899E+00 0.53317320E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.15038835E+01 0.38746912E+00 0.18466160E+00

TOP PRODUCT RECOVERY FRACTIONS
0.31199102E+00 0.48533597E+00 0.53991023E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.18503403E+01 0.87200508E+00 0.72457126E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.11670100E+02	0.26152817E+02	0.52008904E+01
2	0.41670000E+02	0.16134172E+02	0.11140420E+02
3	0.47160000E+02	0.76930102E+01	0.26558660E+02
	0.10050000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,SUM,SSUM,SVC,SLC,DUT	-1.105079	5.000775	49.999949	5.200890	5.200870	2	1
0.352952	18.165727	49.999949	14.140450	18.140450	2	2	
0.352147	26.745848	49.999949	26.558660	26.558660	2	3	
-2.515901	8.527572	49.999914	9.299582	10.189239	3	1	
2.113359	28.132103	49.999914	36.533352	39.020701	3	2	
1.502132	14.940239	49.999914	54.169486	19.790060	3	3	
-2.582965	11.977716	49.999859	11.566550	36.093157	4	1	
1.184953	20.636870	49.999859	32.328472	62.151125	4	2	
0.844702	17.186252	49.999859	48.502994	91.155720	4	3	
-1.147893	12.544357	49.999789	19.569482	35.347097	5	1	
2.131730	19.693154	49.999789	41.177357	33.444056	5	2	
1.393114	12.759384	49.999789	52.952361	37.708816	5	3	

69004

PROBLEM NO.
TIME = 0.FOOD_LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.51429781E+00 0.32841809E+00 0.15729409E+00

PLATE NO. = 1
0.55038053E+00 0.39393082E+00 0.25518865E+00

PLATE NO. = 2
0.23992531E+00 0.41671879E+00 0.34372515E+00

PLATE NO. = 3
0.17852173E+00 0.40264276E+00 0.39883547E+00

REFLUX
0.11138761E+00 0.36331490E+00 0.53487749E+00

TOP PRODUCT
0.11138761E+00 0.36331490E+00 0.53487749E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.15425849E+01 0.39607019E+00 0.18877112E+00

TOP PRODUCT RECOVERY FRACTIONS
0.84574151E+00 0.43894300E+00 0.64195771E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13479487E+01 0.83501319E+00 0.83072958E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15670010E+02	0.25714890E+02	0.60903803E+01
2	0.41370010E+02	0.15420005E+02	0.18165743E+02
3	0.41960010E+02	0.78642047E+01	0.26743875E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,SUD,SBT,S70,SLD,J,I	-1.156721	4.974703	49.999949	5.000381	5.000380	2	1
0.263176	18.122544	49.999949	18.185746	18.185746	2	2	
0.583544	25.432702	49.999949	26.743875	26.743875	2	3	
-2.473478	3.579224	49.999914	9.024401	9.027580	3	1	
1.347759	20.255350	49.999914	34.333363	33.132138	3	2	
1.436736	21.133610	49.999914	51.575205	52.241275	3	3	
-2.244511	11.744335	49.999859	11.584775	35.733285	4	1	
1.351101	20.241381	49.999859	32.518428	62.507815	4	2	
1.355719	17.519323	49.999859	45.018308	51.958922	4	3	
-5.62.875	17.151750	49.999749	18.435357	52.032124	5	1	
2.123774	17.338455	49.999749	41.522505	58.083625	5	2	
2.733333	12.252174	49.999749	40.202756	58.273253	5	3	

PROBLEM NO.
TIME = 0.9999 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.50592b99E+01 0.33579917E+00 0.16067583E+00

PLATE NO. = 1
0.34328705E+00 0.39797839E+00 0.25879457E+00

PLATE NO. = 2
0.25425647E+00 0.41835426E+00 0.33619927E+00

PLATE NO. = 5
0.17859882E+00 0.40472830E+00 0.40167290E+00

REFLUX
0.9244164E+01 0.36815125E+00 0.53665452E+00

TOP PRODUCT
0.9944164E+01 0.36815125E+00 0.53665456E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1916277E+01 0.40062b97E+00 0.1928324bE+00

TOP PRODUCT RECOVERY FRACTIONS
0.2784228E+00 0.45658658E+00 0.6440885bE+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1461730bE+01 0.8571154E+00 0.8369230bE+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1667000E+02	0.25276350E+02	0.4974705E+01
2	0.4197000E+02	0.16889959E+02	0.1819253E+02
3	0.4196000E+02	0.80356917E+01	0.2663729E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,SUO,SSU,SVO,SLO,J,I	-1.181648	4.856538	49.999949	4.974708	4.974708	2	1
0.273817	18.219926	49.999949	18.192563	18.192563	2	2	
0.907831	26.923485	49.999946	26.832729	26.832729	2	3	
-2.343706	9.445564	49.999914	8.767768	9.679941	3	1	
0.973996	20.333780	49.999914	36.558942	20.436415	3	2	
1.369711	28.220681	49.999914	54.573289	28.083644	3	3	
-2.105691	11.537666	49.999839	11.129295	35.244820	4	1	
0.956822	21.037353	49.999839	39.576790	62.625244	4	2	
1.148868	17.424610	49.999839	49.193215	51.929936	4	3	
-3.616492	15.810131	49.999789	17.918482	51.485557	5	1	
1.410754	28.849809	49.999789	41.252442	59.396758	5	2	
1.780758	33.139750	49.999789	48.229075	58.617685	5	3	

69005

69002

PROBLEM NO.
TIME = 1.000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.49665992E+00 0.33914341E+00 0.16392357E+00

PLATE NO. # 3
0.33610405E+00 0.40179987E+00 0.26210010E+00

PLATE NO. # 2
0.23075407E+00 0.42074801E+00 0.34849792E+00

PLATE NO. # 1
0.13671140E+00 0.40557629E+00 0.47771231E+00

REFLUX
0.97150465E+01 0.36439689E+00 0.63560311E+00

TOP PRODUCT
0.97150465E+01 0.36439689E+00 0.63560311E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.16912617E+01 0.40603954E+00 0.12682308E+00

TOP PRODUCT RECOVERY FRACTIONS
0.27158435E+00 0.48724369E+00 0.54826770E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.11781601E+01 0.88416525E+00 0.94809928E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15971000E+02	0.24842996E+02	0.48508432E+01
2	0.11071000E+02	0.10057171E+02	0.18259946E+02
3	0.89000000E+02	0.81773835E+01	0.26928512E+02
	0.40000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SIMILARITIES	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,B,C,D,SSU,SSV,SLU,SLV,I,J	-1.139284	4.737910	49.979947	4.856543	4.856543	2	1
1.272016	18.217127	49.999948	18.219944	18.219944	2	2	
0.714264	27.014312	49.999948	26.923512	26.923512	2	3	
-2.112615	3.223493	49.999914	8.220803	9.445570	3	3	
0.302749	21.424739	49.999954	54.711905	20.583815	3	2	
1.687815	21.451582	49.999914	54.761292	20.823815	3	3	
-1.747513	11.312659	49.999858	14.598225	54.013110	4	1	
0.675564	21.424319	49.999858	53.735264	53.412292	4	2	
0.374243	17.532954	49.999858	49.588211	52.274597	4	3	
-1.232263	16.457635	49.999799	17.445353	50.400015	5	1	
0.033441	21.270755	49.999799	41.719606	63.269980	5	2	
1.217819	18.271751	49.999799	40.586141	59.329414	5	3	

69003

PROBLEM NO.
TIME = 1.1000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.1886387E+00 0.3445975E+00 0.1672655E+00

PLATE NO. = 1
0.3291474E+00 0.4054167E+00 0.2654357E+00

PLATE NO. = 2
0.2263544E+00 0.4224997E+00 0.3506458E+00

PLATE NO. = 5
0.1844721E+00 0.4094958E+00 0.4070319E+00

REFLUX
0.9473629E-01 0.5642432E+00 0.3402947E+00

TOP PRODUCT
0.9473629E-01 0.5644292E+00 0.3402937E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1466132E+01 0.4152440E+00 0.2007425E+01

TOP PRODUCT RECOVERY FRACTIONS
0.2342180E+00 0.4378954E+00 0.6484623E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1742081E+01 0.8511405E+00 0.8491748E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1497000E+02	0.2441843E+02	0.4737314E+01
2	0.4197000E+02	0.1721937E+02	0.1822714E+02
3	0.4156000E+02	0.8361684E+01	0.2731433E+02
	0.1000000E+03	0.6000000E+02	0.5000000E+02

PLATE VARIABLES

STATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000E+01	0.1000000E+01	0.6000000E+02	0.5000000E+02				
0.2000000E+01	0.2000000E+01	0.1100000E+03	0.6000000E+02				
0.3000000E+01	0.3000000E+01	0.1100000E+03	0.1000000E+03				
0.4000000E+01	0.4000000E+01	0.1100000E+03	0.1000000E+03				
0.5000000E+01	0.5000000E+01	0.1100000E+03	0.1000000E+03				
A/SUO/SSU/SVC/SLO/JST	-1.175842	4.520526	49.999949	4.737915	4.737915	2	1
1.264753	18.273603	49.999949	13.247146	13.247146	2	2
1.011089	27.105021	49.999949	27.011939	27.011939	2	3
-2.104104	9.015135	49.999914	9.239387	9.239609	3	1
1.351819	20.507320	49.999914	36.739045	23.424794	3	2
1.258385	27.476911	49.999911	24.940967	20.351597	3	3
-1.817445	11.150750	49.999858	10.581573	34.028165	4	1
1.391182	21.205757	49.999858	32.737511	25.574962	4	2
1.207063	27.553541	49.999858	49.581110	32.996375	4	3
-3.253628	16.151942	49.999789	16.998889	43.672125	5	1
1.714217	21.442174	49.999789	41.775952	31.811515	5	2
1.339411	15.425672	49.999789	41.122149	39.815362	5	3

PROBLEM NO.
TIME = 1.2000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.4801477E+00 0.3425280E+00 0.1705245E+00

PLATE NO. = 1
0.3220403E+00 0.4054845E+00 0.2954514E+00

PLATE NO. = 2
0.2252199E+00 0.4241161E+00 0.3506639E+00

PLATE NO. = 3
0.1802589E+00 0.4101971E+00 0.4095439E+00

V-FLUX
0.9241860E+01 0.3884724E+00 0.5421209E+00

TOP PRODUCT
0.9241860E+01 0.3884724E+00 0.5421209E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1140363E+01 0.4134300E+00 0.2044819E+00

TOP PRODUCT RECOVERY FRACTIONS
0.2771643E+00 0.4886319E+00 0.5506493E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1717692E+01 0.9020190E+00 0.7551122E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1660000E+02	0.2400488E+02	0.4602035E+01
2	0.4150000E+02	0.1747640E+02	0.1827362E+02
3	0.4190000E+02	0.8518718E+01	0.2710504E+02
	0.1000000E+03	0.6000000E+02	0.4000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000E+01	0.1000000E+01	0.6000000E+02	0.6000000E+02				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.6000000E+02				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1300000E+03				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1300000E+03				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.6000000E+02				
A,SJO,SSO,SVC,SLO,J,I	-1.164446	4.504881	49.999949	4.520330	4.520330	2	1
0.2557J1	18.298978	49.999940	18.273521	18.273521	2	2	
0.7007J4	27.134395	49.999940	27.106048	27.106048	2	3	
-1.295535	8.013529	49.999914	8.046215	9.013193	3	1	
0.7955J6	20.559153	49.999914	56.500944	20.503856	3	2	
0.2032J9	20.594232	49.999914	56.112841	20.476946	3	3	
-1.7016J5	10.990300	49.999858	10.432545	55.443989	4	1	
0.7501679	21.280402	49.999858	59.855607	55.017417	4	2	
0.9510926	17.729253	49.999858	48.585948	52.999598	4	3	
-5.0902491	15.522814	49.999799	14.580731	43.596030	5	1	
0.5225J7F	20.404812	49.999799	42.021748	41.926782	5	2	
0.1455503	15.572153	49.999799	41.397220	40.477187	5	3	

69000

PROBLEM NO.
TIME = 1.2000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.47207250E+00 0.35451382E+00 0.17341328E+00

PLATE NO. = 1
0.31648992E+00 0.41209798E+00 0.27144240E+00

PLATE NO. = 2
0.21981671E+00 0.42561745E+00 0.35456583E+00

PLATE NO. = 3
0.17627078E+00 0.41178977E+00 0.41193934E+00

REFLUX
0.49304271E-01 0.36597983E+00 0.54392244E+00

TOP PRODUCT
0.49304271E-01 0.36597983E+00 0.54392244E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.14195355E+01 0.42538256E+00 0.20812924E+00

TOP PRODUCT RECOVERY FRACTIONS
0.27023910E+00 0.43914067E+00 0.55281140E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.15681746E+01 0.86452322E+00 0.86094054E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.14870000E+02	0.25603645E+02	0.45043897E+01
2	0.41570000E+02	0.17726691E+02	0.15298991E+02
3	0.41560000E+02	0.86704640E+01	0.27156123E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

STATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.21000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,SUB,SAT,SVC,SCC,J,I	-1.135289	4.372332	49.999949	4.364836	4.504386	2	1
0.240196	18.322392	49.999940	18.298991	18.298991	2	2	
0.365075	27.254504	49.999940	27.196123	27.196123	2	3	
-1.89e866	8.423322	49.999914	7.844482	3.313544	3	1	
0.743500	20.554103	49.999914	54.334179	20.583489	3	2	
1.149566	20.711388	49.999914	55.277539	20.996967	3	3	
-1.345732	10.450350	49.999858	10.297175	32.772506	4	1	
0.700423	21.553847	49.999858	39.475176	55.842622	4	2	
0.993274	17.314351	49.999858	49.227749	55.184872	4	3	
-2.233666	15.522249	49.999749	15.187555	47.463942	5	1	
0.343542	20.737145	49.999749	42.158752	51.114597	5	2	
0.592813	19.711144	49.999749	41.553352	49.715360	5	3	

T0069

68998

PROBLEM NO.
TIME = 1.4000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.46430225E+00 0.55234256E+00 0.17634822E+00

PLATE NO. = 1
0.81095623E+00 0.41518568E+00 0.27422304E+00

PLATE NO. = 2
0.26911331E+00 0.42711833E+00 0.30636257E+00

PLATE NO. = 5
0.17247375E+00 0.41559276E+00 0.41423344E+00

REFLUX
0.87647134E+01 0.36646022E+00 0.54592256E+00

TOP PRODUCT
0.87647134E+01 0.36646022E+00 0.54592256E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.14926491E+01 0.43117657E+00 0.21166173E+00

TOP PRODUCT RECOVERY FRACTIONS
0.25344571E+00 0.43771709E+00 0.56493996E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.11931572E+01 0.87142565E+00 0.35658756E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15970010E+02	0.23215945E+02	0.43225557E+01
2	0.41370110E+02	0.17867123E+02	0.18523011E+02
3	0.41560010E+02	0.48174107E+01	0.27284532E+02
	0.13333001E+03	0.60000000E+02	0.60000000E+02

PLATE VARIABLES

STAGE LOCATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.60000000E+02	0.60000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.60000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13333301E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13333301E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.60000000E+02				
A,SOO,SOI,S70,SL0,J,I	-1.170414	4.233271	49.999949	4.392357	4.392357	2	1
0.223261	18.545518	49.999949	18.525011	18.525011	2	2	
0.869594	27.371150	49.999949	27.284632	27.284632	2	3	
-4.30.868	4.445755	49.999914	7.535211	8.023957	3	1	
0.700667	20.754167	49.999914	56.371282	20.961159	3	2	
1.30.250	20.822111	49.999914	55.434818	20.711924	3	3	
-1.505719	10.540553	49.999858	10.135512	52.492594	4	1	
0.959996	21.410115	49.999858	59.915147	54.152740	4	2	
0.950068	17.933167	49.999858	49.953543	53.451355	4	3	
-2.791653	15.231184	49.999799	15.115333	53.332942	5	1	
1.102946	21.218775	49.999799	49.237514	52.277852	5	2	
1.622752	15.843219	49.999799	41.533335	41.184206	5	3	

68999

PROBLEM ID.
TIME = 1.5000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.4866166[illegible]E+01 0.3640074[illegible]E+00 0.1721785[illegible]E+01

PLATE ID. = 1
0.5351029[illegible]E+00 0.4181[illegible]E+00 0.2768[illegible]E+00

PLATE ID. = 2
0.2136[illegible]E+00 0.4283[illegible]E+00 0.3580[illegible]E+00

PLATE ID. = 3
0.1685[illegible]E+00 0.4146[illegible]E+00 0.4164[illegible]E+00

FEED
0.8956[illegible]E+01 0.3669[illegible]E+00 0.5474[illegible]E+00

TOP PRODUCT
0.8956[illegible]E+01 0.3669[illegible]E+00 0.5474[illegible]E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1[illegible]E+01 0.4657[illegible]E+00 0.2150[illegible]E+00

TOP PRODUCT RECOVERY FRACTIONS
0.2[illegible]E+00 0.4402[illegible]E+00 0.5570[illegible]E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1[illegible]E+01 0.8[illegible]E+00 0.7[illegible]E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.[illegible]E+02	0.2[illegible]E+02	0.4[illegible]E+01
2	1.[illegible]E+02	0.1[illegible]E+02	0.1[illegible]E+02
3	0.[illegible]E+02	0.[illegible]E+01	0.[illegible]E+02
	0.[illegible]E+03	0.5[illegible]E+02	0.5[illegible]E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1[illegible]E+01	0.1[illegible]E+01	0.5[illegible]E+02	0.5[illegible]E+02				
0.1[illegible]E+01	0.1[illegible]E+01	0.1[illegible]E+03	0.5[illegible]E+02				
0.1[illegible]E+01	0.1[illegible]E+01	0.1[illegible]E+03	0.1[illegible]E+03				
0.1[illegible]E+01	0.1[illegible]E+01	0.1[illegible]E+03	0.1[illegible]E+03				
0.1[illegible]E+01	0.1[illegible]E+01	0.1[illegible]E+03	0.5[illegible]E+02				
A/SUM/SUM/SUM/SUM/ITAT	-1.[illegible]	4.[illegible]	49.[illegible]	4.283275	4.283275	2	1
1.204[illegible]	19.[illegible]	49.[illegible]	19.[illegible]	19.[illegible]		2	2
2.[illegible]	27.[illegible]	49.[illegible]	27.[illegible]	27.[illegible]		2	3
-1.[illegible]	9.[illegible]	49.[illegible]	7.[illegible]	8.[illegible]		3	1
1.[illegible]	21.[illegible]	49.[illegible]	36.[illegible]	20.[illegible]		3	2
1.[illegible]	28.[illegible]	49.[illegible]	55.[illegible]	21.[illegible]		3	3
-1.[illegible]	11.[illegible]	49.[illegible]	9.[illegible]	52.[illegible]		4	1
0.[illegible]	21.[illegible]	49.[illegible]	59.[illegible]	54.[illegible]		4	2
2.[illegible]	17.[illegible]	49.[illegible]	50.[illegible]	55.[illegible]		4	3
-2.[illegible]	14.[illegible]	49.[illegible]	15.[illegible]	46.[illegible]		5	1
2.[illegible]	21.[illegible]	49.[illegible]	42.[illegible]	52.[illegible]		5	2
2.[illegible]	15.[illegible]	49.[illegible]	42.[illegible]	41.[illegible]		5	3

cm 1 2 3 4 5 6 7 8 9 10 11 12 unesp 17 18 19 20 21 22 23 24 25 26 27 28

68996

PROBLEM NO.
TIME = 1.0000 [DDD] MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.4193883256+00 1.3636032986+00 0.1812003486+00

PLATE NO. = 1
0.2296924036+00 0.4206001626+00 0.2794044356+00

PLATE NO. = 2
1.2107664106+00 0.4226600026+00 1.3296755586+00

PLATE NO. = 3
0.1334468596+00 0.4151003566+00 0.4186530466+00

V-FLUX
1.4659977706+01 1.5673500446+00 0.5491101236+00

TOP PRODUCT
0.4659977706+01 0.5673500466+00 0.5491101006+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1340445006+01 0.4421709436+00 0.2183227106+00

TOP PRODUCT RECOVERY FRACTIONS
0.2580527206+00 0.4407507906+00 0.5590037576+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1597113446+01 0.8823516776+00 0.8775635806+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.2597000006+02	0.9247941136+02	0.4177958596+01
2	0.4107000106+02	0.1842626656+02	0.1858650206+02
3	0.4196000106+02	0.6909324136+01	0.2785555596+02
	0.1000000106+03	0.5000000006+02	0.5000000006+02

PLATE VARIABLES

STAGE	TEMPERATURE	VAPOR FLOW	LIQUID FLOW	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000006+01	1.1100000006+01	0.2000000006+02	0.5000000006+02				
0.2000000006+01	0.1100000006+01	0.1000000006+03	0.5000000006+02				
0.3000000006+01	0.1100000006+01	0.1000000006+03	0.5000000006+02				
0.4000000006+01	1.1000000006+01	0.1000000006+03	0.5000000006+02				
0.5000000006+01	1.1000000006+01	0.1000000006+03	0.5000000006+02				
ACSORSOR,SO,SC,SC7,I	+1.1+2582	4.0775701	49.9999947	4.177988	4.177988	2	1
2.193440	14.585174	49.999949	14.586502	14.586502	2	2	
0.513922	27.557674	49.999949	27.558509	27.558509	2	3	
-1.622510	9.107455	49.999914	7.545546	8.273428	3	1	
2.013791	20.351838	49.999914	34.720914	20.801029	3	2	
1.110059	21.128655	49.999914	35.729944	20.927545	3	3	
-1.542550	11.414155	49.999958	9.503074	31.914960	4	1	
0.673170	21.532744	49.999958	32.999592	84.461002	4	2	
0.756139	14.150157	49.999958	50.212554	85.751067	4	3	
-3.624459	14.732.2.	49.999799	15.138277	44.455104	5	1	
2.322777	21.177[40	49.999799	43.522535	85.153243	5	2	
1.212691	11.121405	49.999799	42.510187	81.711555	5	3	

68997

PROBLEM NO.
TIME = 1.7000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.4429516?E+00 0.5728357?E+00 0.1845325?E+00

PLATE NO. = 1
0.2749451?E+00 0.4236465?E+00 0.3013077?E+00

PLATE NO. = 2
0.2181817?E+00 0.4817165?E+00 0.3012012?E+00

PLATE NO. = 3
0.1521?953E+00 0.4179384?E+00 0.4299719?E+00

REFLUX
0.4655410?E+01 0.5677178?E+00 0.5507483?E+00

TOP PRODUCT
0.4655410?E+01 0.5677178?E+00 0.5507483?E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1527529?E+01 0.4473?712E+00 0.2214?452E+01

TOP PRODUCT RECOVERY FRACTIONS
0.2445?840E+00 0.4419?614E+00 0.5610?840E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1?72142?E+01 0.4885?52?E+00 0.3824?72?E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1?97?011E+02	0.2213?541E+02	0.4076?071E+01
2	0.4137?111E+02	0.1?641?43E+02	0.1?54?825E+02
3	0.4?5?001?E+02	0.?229?513E+01	0.2?57?402E+02
	0.1?????00?E+03	0.?000?000E+02	0.?0???00?E+02

PLATE VARIABLES

STAGE FLOWS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1??0?000E+01	0.1?0?1000E+01	0.?000?000E+02	0.?000?000E+02				
0.1??0?000E+01	0.1?0?0000E+01	0.1?00?000E+03	0.?000?000E+02				
0.1??0?000E+01	0.1?0?0000E+01	0.1?00?000E+03	0.1?00?000E+03				
0.1??0?000E+01	0.1?0?3000E+01	0.1?00?000E+03	0.1?00?000E+03				
0.1??0?000E+01	0.1?0?0000E+01	0.1?00?000E+03	0.?000?000E+02				
A,S,J,O,SST,S,O,S,T,J,T -0.?71?42	3.?7?527	49.?7?747	4.?75?05	4.?78?05	2	1	
3.1?3320	14.4?5?19	49.?22?49	18.?65?95	16.?66?93	2	2	
3.?95?2?	27.6?5?06	49.?69?49	27.?37402	27.?37402	2	3	
-1.?52?45	7.?54?58	42.?29?14	7.?81?68	8.?02?77	3	1	
3.?82?69	20.?21?22	42.?29?14	28.?52?05	20.?61?24	3	2	
3.46?7?6	21.1?3?5?	42.?29?14	56.?68?25	21.?24?99	3	3	
-1.?6?5?1	10.?77?97	49.?69?58	9.?64?95	31.?19?60	4	1	
3.54?8?7	21.?8?1?2	42.?69?58	40.?1?5?6	64.?02?54	4	2	
3.72?5?4	14.1?2?89	49.?69?58	50.?97?29	54.?50?86	4	3	
-2.40?1?8	14.4?2?35	42.?29?58	14.?27?17	34.1?6?69	5	1	
1.25?5?7	21.?02?29	42.?29?58	42.?38?45	65.?5?52	5	2	
1.14?7?2	14.?14?75	42.?02?58	42.?64?59	42.?71?92	5	3	

68994

PROBLEM NO.
TIME = 1.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.48594022E+00 0.52703004E+00 0.18715256E+01

PLATE NO. = 1
0.23994293E+00 0.42039688E+00 0.28410070E+00

PLATE NO. = 2
0.23594260E+00 0.48190144E+00 0.52065234E+00

PLATE NO. = 3
0.13598204E+00 0.41440316E+00 0.12250780E+00

FEED
0.77578617E+01 0.36807470E+00 0.55233458E+00

TOP PRODUCT
0.77578617E+01 0.36807470E+00 0.55233458E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13075994E+01 0.45236380E+00 0.22460752E+00

TOP PRODUCT RECOVERY FRACTIONS
0.25872411E+00 0.44146481E+00 0.55200758E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.15452439E+01 0.89401818E+00 0.88711220E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15077000E+02	0.21777015E+02	0.39795338E+01
2	0.41077000E+02	0.18850002E+02	0.18403735E+02
3	0.41000000E+02	0.95529832E+01	0.27016734E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
A,SUO,SSU,S70,SL0,JJI	-0.930556	3.446471	49.999949	3.979531	3.979531	2	1
0.100432	18.420859	49.999949	18.493785	18.493785	2	2	
0.766925	27.633396	49.999949	27.510734	27.510734	2	3	
-1.479038	7.898856	49.999914	7.998704	7.954452	3	1	
0.540127	20.974855	49.999914	54.979902	20.721158	3	2	
0.420941	21.218042	49.999914	50.000392	21.126390	3	3	
-1.201673	30.155850	49.999858	9.998609	30.031391	4	1	
0.912899	21.041287	49.999858	49.985402	24.770605	4	2	
0.088516	14.201521	49.999858	50.045939	24.397944	4	3	
-2.083973	14.255658	49.999780	14.553875	43.279459	5	1	
0.292671	21.421958	49.999780	42.728815	43.284456	5	2	
1.092502	14.551385	49.999780	42.757809	42.815104	5	3	

68995

PROBLEM NO.
TIME = 1.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.42930921E+00 0.38110062E+00 0.18940017E+00

PLATE NO. = 1
0.24527445E+00 0.42444053E+00 0.28628451E+00

PLATE NO. = 2
0.20313429E+00 0.43282915E+00 0.36403450E+00

PLATE NO. = 3
0.19613770E+00 0.41949942E+00 0.42436158E+00

REFLUX
0.77729983E+01 0.56640157E+00 0.55386333E+00

TOP PRODUCT
0.77729983E+01 0.56640157E+00 0.55386333E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12802701E+01 0.45710417E+00 0.22742446E+00

TOP PRODUCT RECOVERY FRACTIONS
0.23514500E+00 0.44204652E+00 0.66474950E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.15214151E+01 0.89921084E+00 0.89217512E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.65770100E+02	0.21475451E+02	0.43294231E+01
2	0.41570000E+02	0.19030851E+02	0.22420078E+02
3	0.41350000E+02	0.94746865E+01	0.27593425E+02
	0.12502500E+03	0.50000000E+02	0.50002500E+02

PLATE VARIABLES

STATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.11000000E+01	0.50000000E+02	0.50000000E+02				
0.20000000E+01	0.11000000E+01	0.10000000E+03	0.50000000E+02				
0.30000000E+01	0.11000000E+01	0.10000000E+03	0.15000000E+03				
0.40000000E+01	0.11000000E+01	0.10000000E+03	0.15000000E+03				
0.50000000E+01	0.11000000E+01	0.10000000E+03	0.50000000E+02				
ASSUMED,SVD,SCALED	-0.349250	5.777564	40.000047	3.886495	3.886495	2	1
0.149107	13.454370	49.999949	18.420078	18.420078	2	2	
0.747025	27.757811	49.999949	27.593425	27.593425	2	3	
-2.403513	7.666680	49.999914	6.586760	7.309959	3	1	
0.513007	21.026541	49.999914	36.439264	20.974971	3	2	
0.387436	21.336786	49.999914	36.125376	21.213079	3	3	
-1.155147	10.744520	49.999834	9.400711	10.470884	4	1	
1.186811	21.639569	49.999834	40.000324	64.724373	4	2	
0.958235	24.257749	49.999834	50.369365	64.984739	4	3	
-4.172712	11.134117	49.999789	14.256852	42.791244	5	1	
1.131849	21.535121	49.999789	42.422437	64.265079	5	2	
1.141852	24.414221	49.999789	42.421811	42.942878	5	3	

68992

PROBLEM NO.
TIME = 2.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.42333239E+00 0.38484074E+00 0.19182090E+00

PLATE NO. = 1
0.24092952E+00 0.43170424E+00 0.32836624E+00

PLATE NO. = 2
0.20086302E+00 0.46372478E+00 0.33541217E+00

PLATE NO. = 3
0.15384199E+00 0.42053156E+00 0.42561346E+00

REFLUX
0.75991440E+01 0.36869978E+00 0.63130022E+00

TOP PRODUCT
0.75991440E+01 0.36869978E+00 0.63130022E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12827431E+01 0.46177195E+00 0.25022911E+00

TOP PRODUCT RECOVERY FRACTIONS
0.92730879E+00 0.44240436E+00 0.55659518E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.14975614E+01 0.90417650E+00 0.88675422E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.21106618E+02	0.53773720E+01
2	0.41070000E+02	0.19242037E+02	0.16434329E+02
3	0.41060000E+02	0.95913448E+01	0.27767439E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,SOO,SSO,SVC,SLO,JJI	-0.548756	5.712492	49.999949	3.707572	3.797572	2	1
0.138542	18.448624	49.999949	18.434989	18.434989	2	2	
0.715224	27.438753	49.999949	27.767439	27.767439	2	3	
-1.539454	7.533145	49.999914	6.746378	7.946599	3	1	
0.452930	41.079137	49.999914	37.805520	21.026578	3	2	
0.547478	21.391734	49.999914	54.248102	21.506323	3	3	
-1.076590	9.255283	49.999857	9.279972	30.129457	4	1	
0.459182	41.735186	49.999857	40.635864	22.062217	4	2	
0.923928	18.329372	49.999857	50.536964	54.001325	4	3	
-2.169968	13.839720	49.999789	13.994440	42.133428	5	1	
1.374953	21.642577	49.999789	42.210869	24.083685	5	2	
0.994805	14.517492	49.999789	43.994693	45.284936	5	3	

68989

PROBLEM NO.
TIME = 2.5000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.3900172?E+00 0.4012?945E+00 0.2022052?E+00

PLATE NO. = 1
0.2021743?E+00 0.44041193E+00 0.29741371E+00

PLATE NO. = 2
0.1911412?E+00 0.43?85?45E+00 0.3?100123E+00

PLATE NO. = 3
0.1412153?E+00 0.424?5610E+00 0.43392?54E+00

REFLUX
1.6?2?0?52E-01 0.3?9?1?30E+00 0.5?195?55E+00

TOP PRODUCT
0.6?2?0?52E-01 0.3?9?1?30E+00 0.5?195?55E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11?7?145E-01 0.4?2?9?77E+00 0.242?22?5E+00

TOP PRODUCT RECOVERY FRACTIONS
0.?24?49?3E+00 0.44?744?6E+00 0.47445??0E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1?92?632E+01 0.?25?4?85E+00 0.?171?2?1E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1?07?000E+02	0.1?4?0?64?E+02	0.?411?02?E+01
2	0.41?7?000E+02	0.2??8?47?E+02	0.184?0?15E+02
3	0.4?96?000E+02	0.101?01?3E+02	0.?89?7?52E+02
	0.1??????0E+03	0.5??????0E+02	0.5??????0E+02

PLATE VARIABLES

STATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000?E+01	0.1000000?E+01	0.?000000?E+?2	0.?000000?E+02				
0.2000000?E+01	0.1000000?E+01	0.1000000?E+03	0.?000000?E+02				
0.3000000?E+01	0.1000000?E+01	0.1000000?E+03	0.?000000?E+03				
0.4000000?E+01	0.1000000?E+01	0.1000000?E+03	0.?000000?E+03				
0.5000000?E+01	0.1000000?E+01	0.1000000?E+03	0.?000000?E+02				
A,SUD,SSD,SVC,SLS?J,I	-0.?63693	5.345?30	49.999949	3.?11503	3.?11503	2	1
0.07??9?	18.499??6	49.999949	18.490815	18.490815	2	2	
0.?85?07	25.?56?43	49.999949	28.097?62	28.097?62	2	3	
-1.?40?05	6.956?49	49.999913	6.159?12	7.0??9?8	3	1	
0.?59?71	21.27?7?6	49.?99913	57.061?2?	21.?42805	3	2	
3.0?0?05	21.?54?39	49.999913	56.?79?01	21.0?6?27	3	3	
-?.?27?36	?.?74?14	49.?99?57	?.?68?11	28.071191	4	1	
0.339?5?	21.?26?85	49.999?57	40.172?83	55.?78617	4	2	
0.?87?50	18.?98?39	49.999?57	51.058501	55.???192	4	3	
-1.011100	12.?47?22	49.999?68	12.?81?46	32.?26154	5	1	
3.?27?55	22.108?49	49.?99?5?	43.?7?058	55.?61?90	5	2	
3.?56?44	14.?4?0?7	49.999?68	43.?89816	44.?12056	5	3	

cm 1 2 3 4 5 6 7 8 9 10 11 12 unesp 17 18 19 20 21 22 23 24 25 26 27 28

68982

PROBLEM NO.
TIME = 3.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.6234772E+00 0.4153838E+00 0.2106545E+00

PLATE NO. = 1
0.2478858E+00 0.4479797E+00 0.3040447E+00

PLATE NO. = 2
0.1055722E+00 0.4408918E+00 0.3764338E+00

PLATE NO. = 3
0.1317899E+00 0.4283510E+00 0.4401590E+00

REFLUX
0.6222525E+01 0.5704501E+00 0.5673285E+00

TOP PRODUCT
0.6222525E+01 0.5704501E+00 0.5673285E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1121717E+01 0.4984018E+00 0.2524207E+00

TOP PRODUCT RECOVERY FRACTIONS
0.1000523E+00 0.4445046E+00 0.5809008E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1233359E+01 0.9429084E+00 0.8333903E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1507300E+02	0.1869861E+02	0.5111140E+01
2	0.4107010E+02	0.2079340E+02	0.1832259E+02
3	0.4196000E+02	0.1053273E+02	0.2856955E+02
	0.1000000E+03	0.6000000E+02	0.4000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000000E+01	0.1000000E+01	0.5000000E+02	0.5000000E+02				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.5000000E+02				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1000000E+03				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1000000E+03				
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.5000000E+02				
A,B00,B00,B70,B00,J,I	-0.515100	3.059447	49.999948	3.111161	3.111161	2	1
3.041599	18.326676	49.999948	18.322500	18.322500	2	2	
3.471241	28.418125	49.999948	28.366330	28.366330	2	3	
-3.407443	6.538739	49.999913	6.709221	6.280495	3	1	
3.284776	21.428491	49.999913	37.086476	21.402551	3	2	
3.942657	22.052143	49.999913	57.205902	22.007954	3	3	
-3.535723	9.119911	49.999857	8.980115	27.253840	4	1	
1.256773	22.052496	49.999857	40.261094	66.133773	4	2	
3.582950	15.810329	49.999857	31.533193	56.316357	4	3	
-1.256615	12.252199	49.999788	12.034754	57.133357	5	1	
3.035519	22.457441	49.999788	43.240590	67.181954	5	2	
1.220136	15.290182	49.999788	44.418576	46.084708	5	3	

68979

PROBLEM NO.
TIME = 3.5000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.35632820E+00 0.42617309E+00 0.21749871E+00

PLATE NO. = 1
0.23016466E+00 0.45360995E+00 0.31022539E+00

PLATE NO. = 2
0.17791936E+00 0.44315629E+00 0.37892435E+00

PLATE NO. = 3
0.12448076E+00 0.43039783E+00 0.44512141E+00

REFLUX
0.57589005E+01 0.37076054E+00 0.57165046E+00

TOP PRODUCT
0.57589005E+01 0.37076054E+00 0.57165046E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.10607708E+01 0.51136680E+00 0.26104022E+00

TOP PRODUCT RECOVERY FRACTIONS
0.17273247E+00 0.44487706E+00 0.66609032E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.12415033E+01 0.95624386E+00 0.92713054E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670010E+02	0.17814410E+02	0.28794502E+01
2	0.41670000E+02	0.21308654E+02	0.18538027E+02
3	0.41660000E+02	0.10874936E+02	0.28582523E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03				
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02				
A,SUO,SSU,SVI,SLO,JT	-0.304832	2.839964	49.999948	2.879450	2.879450	2	1
0.016964	18.539704	49.999948	18.538027	18.538027	2	2	
0.577657	28.582850	49.999948	28.582523	28.582523	2	3	
-0.623106	6.161517	49.999913	5.364069	6.224038	3	1	
0.068637	21.539220	49.999913	37.093018	21.519891	3	2	
0.431449	22.299177	49.999913	57.542913	22.456070	3	3	
-0.490553	6.556356	49.999836	8.083551	26.687904	4	1	
0.189149	22.176657	49.999836	40.268540	66.473443	4	2	
0.301533	18.976824	49.999836	51.647909	56.838653	4	3	
-0.977997	11.710583	49.999788	11.386584	35.424699	5	1	
0.486653	22.725097	49.999788	43.741241	58.041493	5	2	
0.491344	15.466308	49.999788	44.572175	46.533808	5	3	

68972

PROBLEM NO.
TIME = 4.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.5822818E+00 0.4847058?E+00 0.2251123?E+00

PLATE ID. = 4
0.2279482E+00 0.4570972?E+00 0.3147079?E+00

PLATE ID. = 2
0.1758461?E+00 0.444?4264E+00 0.3417?420E+00

PLATE ID. = 3
0.1184?002E+00 0.432?0964E+00 0.4490637?E+00

FEED
0.5402?44?E+04 0.3708?080E+00 0.5751152?E+00

TOP PRODUCT
0.5402?44?E+01 0.3708?080E+00 0.5751152?E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
1.1120?010E+01 0.9214?532E+00 0.2670?7?2E+00

TOP PRODUCT RECOVERY FRACTIONS
0.1521?55?E+00 0.4409?73?E+00 0.4902?620E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1?8?0?5?E+01 0.?0?60?08E+00 0.?5?0?52?E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1?27?000E+02	0.1?114?0?E+02	0.?70127??E+01
2	0.4127?000E+02	0.?17?5?94E+02	0.1?5?50?0E+02
3	0.4127?000E+02	0.111?0?17E+02	0.?87?5??0E+02
	0.100?000?E+03	0.?00?0000E+02	0.?00?0000E+02

PLATE VARIABLES

SIMMERINGS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY		
0.1000?000E+01	0.1100?000E+01	0.?0000000E+12	0.?0000000E+02				
0.1000?000E+01	0.1100?000E+01	0.1000?000E+03	0.?0000000E+02				
0.1000?000E+01	0.1100?000E+01	0.1000?000E+03	0.1?000000E+03				
0.1000?000E+01	0.1100?000E+01	0.1000?000E+03	0.1?000000E+03				
0.1000?000E+01	0.1100?000E+01	0.1000?000E+03	0.?0000000E+02				
A/SUD,SSD,S?D,S.S.D.F	-0.?05?52	2.?7?970	19.?79?4?	2.?01?99	2.?01?99	2	1
0.?01?02	18.5451?1	49.?99?4?	18.?45?40	18.?45?40	2	2	
0.?02?00	24.?95?15	47.?99?4?	29.?55?60	23.?56?60	2	3	
-0.4?5?25	5.8?3?20	49.?99?1?	5.?99?57	5.?41?32	3	1	
0.1?1?07	21.5?9?05	49.?99?1?	37.?87?82	21.?06?482	3	2	
0.?32?15	22.?37?98	49.?99?1?	57.?13?80	22.?53?66	3	3	
-0.?75?52	4.?35?55	19.?99?36	7.?35?47	26.?22?474	4	1	
0.1?1?62	22.?55?24	49.?99?36	40.?91?51	29.?26?596	4	2	
0.?53?09	15.1?7?46	49.?99?35	51.?53?21	37.?51?150	4	3	
-0.?6?17?	41.?45?74	19.?97?37	10.?48?28	34.?94?223	5	1	
0.?72?5?	22.?35?99	49.?99?37	43.?81?98	38.?73?542	5	2	
0.?83?12	15.?74?15	49.?99?37	45.?29?74	47.?06?195	5	3	

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FORTRAN IV, 2022Ho.004,    JUL   1967
$JOB      NOLIST,NOCARDS
$PAUSE
CARDS REMAINING IN DECK ARE--

$JOB      NOLIST,NOCARDS
$PAUSE

MAY 24 AA      20 32.1
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68970

DB - Resultados Parciais para o Método de Euler,

$\Delta t = 0,2$ min.

INPUT DATA DYNAMIC DISTILLATION HOLLANDS METHOD

NO. OF COMPONENTS	STRIPPING PLATES	RECTIFYING PLATES	REFERENCE COMPONENT
3	1	2	

LIQUID FEED RATE = 9.99999996E+01 VAPOR FEED RATE = 0.00000000E-01 FEED TEMPERATURE = 0.00000000E-01

LIQUID FEED COMPOSITION	VAPOR FEED COMPOSITION	BY COMPONENT
1.66700000E-01	0.00000000E-01	1
4.16699999E-01	0.00000000E-01	2
4.16600000E-01	0.00000000E-01	3

TRAY	TEMPERATURE	VAPOR FLOW RATE	LIQUID FLOW RATE	HOLD UP
-1	0.00000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
0	1.00000E+00	4.99999998E+01	4.99999998E+01	4.99999998E+01
1	1.00000E+00	9.99999996E+01	4.99999998E+01	4.99999998E+01
2	1.00000E+00	9.99999996E+01	1.49999999E+02	4.99999998E+01
3	1.00000E+00	9.99999996E+01	1.49999999E+02	4.99999998E+01
4	1.00000E+00	9.99999996E+01	4.99999998E+01	4.99999998E+01
5	0.00000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
-1	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
0	0.11070800	0.11070800	0.36151400	0.36151400	0.52777700	0.52777700		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
1	0.23686400	0.11070800	0.38673600	0.36151400	0.37639800	0.52777700		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
2	0.33972800	0.17378700	0.36568000	0.37412500	0.29458800	0.45208800		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
3	0.41066800	0.23194700	0.35764400	0.39627900	0.23168400	0.37177300		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
4	0.55529000	0.35035600	0.30446400	0.38422900	0.14022200	0.26541700		

COMPOSITIONS

TRAY	C1 LIQUID	C1 VAPOR	C2 LIQUID	C2 VAPOR	C3 LIQUID	C3 VAPOR	C4 LIQUID	C4 VAPOR
5	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000		

EQUILIBRIUM CONSTANTS

COMP.	A1	A2	A3	A4
1	9.99999999E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
2	2.00000000E+00	0.00000000E-01	0.00000000E-01	0.00000000E-01
3	2.99999999E+00	0.00000000E-01	0.00000000E-01	0.00000000E-01

LIQUID ENTHALPY CONSTANTS

COMP.	C1	C2	C3	C4
1	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

2912x9

	2	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
	3	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

D32

VAPOR ENTHALPY CONSTANTS

COMP.	E1	E2	E3	E4
1	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
2	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
3	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

KB BY TRAY

0.00000000
0.41572400
0.46739100
0.51154200
0.55401100
0.63094200
0.00000000

25169

FOR THIS RUN DELF = 0,20001

25171

PROBLEM NO.
TIME = 0.2000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.55529307E+00 0.30448506E+00 0.14022187E+00

PLATE NO. = 1
0.41866944E+00 0.35764557E+00 0.22368498E+00

PLATE NO. = 2
0.27320866E+00 0.39916176E+00 0.32762959E+00

PLATE NO. = 3
0.23666473E+00 0.38673654E+00 0.37659873E+00

REFLUX
0.11070811E+00 0.36161436E+00 0.52777753E+00

TOP PRODUCT
0.11070811E+00 0.36161436E+00 0.52777753E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.19655461E+01 0.36535285E+00 0.16829319E+00

TOP PRODUCT RECOVERY FRACTIONS
0.35215792E+00 0.43378253E+00 0.63343438E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.19976040E+01 0.79913538E+00 0.80172756E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.27764653E+02	0.55354035E+01
2	0.41670000E+02	0.15224253E+02	0.14975718E+02
3	0.41660000E+02	0.70110936E+01	0.26588870E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25142

PROBLEM NO.
TIME = 0.4000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.55529277E+00 0.30448518E+00 0.14022205E+00

PLATE NO. = 1
0.37875701E+00 0.37733688E+00 0.24350931E+00

PLATE NO. = 2
0.26292123E+00 0.40676870E+00 0.33031007E+00

PLATE NO. = 3
0.22054425E+00 0.39252145E+00 0.38693430E+00

REFLUX
0.11070829E+00 0.36151451E+00 0.52777719E+00

TOP PRODUCT
0.11070829E+00 0.36151451E+00 0.52777719E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.16655452E+01 0.36535299E+00 0.16829339E+00

TOP PRODUCT RECOVERY FRACTIONS
0.33205846E+00 0.43376272E+00 0.63343398E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.19976037E+01 0.79913570E+00 0.80172737E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.27764639E+02	0.55554145E+01
2	0.41070000E+02	0.15224259E+02	0.18075720E+02
3	0.41960000E+02	0.70111025E+01	0.26883850E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.50000000E+02		

25143

PROBLEM NO.
TIME = 0.6000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.55134508E+00 0.31553818E+00 0.15211674E+00

PLATE NO. = 1
0.36815319E+00 0.38679291E+00 0.24505391E+00

PLATE NO. = 2
0.24633264E+00 0.41253994E+00 0.34112737E+00

PLATE NO. = 3
0.20872618E+00 0.39877442E+00 0.39249940E+00

REFLUX
0.10714603E+00 0.36185821E+00 0.53099575E+00

TOP PRODUCT
0.10714603E+00 0.36185821E+00 0.53099575E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.15957165E+01 0.37981543E+00 0.18256930E+00

TOP PRODUCT RECOVERY FRACTIONS
0.32137382E+00 0.43419512E+00 0.43729657E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.11150903E+01 0.81401055E+00 0.81986618E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16970000E+02	0.26567254E+02	0.5357301[illegible]E+01
2	0.41070000E+02	0.15826909E+02	0.19092911E+02
3	0.41960000E+02	0.76058372E+01	0.26249756E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25144

PROBLEM NO.
TIME = 0.8000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.51483404E+00 0.32906562E+00 0.15610034E+00

PLATE NO. = 1
0.34773481E+00 0.39361740E+00 0.25864779E+00

PLATE NO. = 2
0.23838099E+00 0.41876680E+00 0.34285221E+00

PLATE NO. = 3
0.19721502E+00 0.40285341E+00 0.39993157E+00

REFLUX
0.10251982E+00 0.36320132E+00 0.53427886E+00

TOP PRODUCT
0.10251982E+00 0.36320132E+00 0.53427886E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.15441933E+01 0.39484716E+00 0.18735038E+00

TOP PRODUCT RECOVERY FRACTIONS
0.30749797E+00 0.46580671E+00 0.64123723E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.18516913E+01 0.86065387E+00 0.82658751E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.25741702E+02	0.91259911E+01
2	0.41670000E+02	0.16453281E+02	0.25160056E+02
3	0.41660000E+02	0.78950169E+01	0.26713983E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25145

PROBLEM NO.
TIME = 1.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.49533633E+00 0.33902702E+00 0.16593736E+00

PLATE NO. = 1
0.33460961E+00 0.40451590E+00 0.26087550E+00

PLATE NO. = 2
0.22895920E+00 0.42035830E+00 0.35069151E+00

PLATE NO. = 3
0.13777235E+00 0.40780278E+00 0.40442487E+00

REFLUX
0.97324943E-01 0.36423227E+00 0.53844278E+00

TOP PRODUCT
0.97324943E-01 0.36423227E+00 0.53844278E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.14848099E+01 0.40677988E+00 0.19915670E+00

TOP PRODUCT RECOVERY FRACTIONS
0.29191545E+00 0.43704376E+00 0.54623474E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.17767264E+01 0.84384364E+00 0.84539144E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16970010E+02	0.24791731E+02	0.48862472E+01
2	0.41970010E+02	0.10921351E+02	0.18411614E+02
3	0.41060010E+02	0.82988679E+01	0.26722139E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25145

PROBLEM NO;
TIME = 1.2000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.47840437E+00 0.35149071E+00 0.17010493E+00

PLATE NO. = 1
0.32027147E+00 0.40832607E+00 0.27140546E+00

PLATE NO. = 2
0.22218403E+00 0.42582160E+00 0.35199437E+00

PLATE NO. = 3
0.17896265E+00 0.41040488E+00 0.41063248E+00

REFLUX
0.92278909E-01 0.36571725E+00 0.54200584E+00

TOP PRODUCT
0.92278909E-01 0.36571725E+00 0.54200584E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.14349261E+01 0.42175511E+00 0.20415458E+00

TOP PRODUCT RECOVERY FRACTIONS
0.27678137E+00 0.43832559E+00 0.65050870E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.17117075E+01 0.86058070E+00 0.85466727E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.23920218E+02	0.46139454E+01
2	0.41670000E+02	0.17574935E+02	0.18285952E+02
3	0.41660000E+02	0.85052465E+01	0.27100172E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.11000000E+11	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.50000000E+02		

25147

PROBLEM NO.
TIME = 1.4000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.46176832E+00 0.35996877E+00 0.17826291E+00

PLATE NO. = 1
0.30867834E+00 0.41762112E+00 0.27350054E+00

PLATE NO. = 2
0.21527631E+00 0.42636317E+00 0.35816053E+00

PLATE NO. = 3
0.17127740E+00 0.41429431E+00 0.41442829E+00

REFLUX
0.87444244E+01 0.36655063E+00 0.53600312E+00

TOP PRODUCT
0.87444244E+01 0.36655063E+00 0.53600312E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13850280E+01 0.43192797E+00 0.21394972E+00

TOP PRODUCT RECOVERY FRACTIONS
0.26226028E+00 0.43932558E+00 0.65531100E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.16473082E+01 0.87175555E+00 0.86926072E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15670000E+02	0.23038410E+02	0.43722122E+01
2	0.41970000E+02	0.17998437E+02	0.14827552E+02
3	0.41960000E+02	0.89151450E+01	0.27501220E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.11000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.50000000E+02		

25149

PROBLEM NO.
TIME = 1.6000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.44713430E+00 0.37077849E+00 0.18208722E+00

PLATE NO. = 1
0.29743627E+00 0.42049906E+00 0.28206458E+00

PLATE NO. = 2
0.20974967E+00 0.43097246E+00 0.35927786E+00

PLATE NO. = 3
0.16415287E+00 0.41623940E+00 0.41960773E+00

REFLUX
0.83008830E-01 0.36768480E+00 0.54930657E+00

TOP PRODUCT
0.83008830E-01 0.36768480E+00 0.54930657E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13411547E+01 0.44489659E+00 0.21853758E+00

TOP PRODUCT RECOVERY FRACTIONS
0.24897670E+00 0.44186646E+00 0.65927513E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.15901114E+01 0.88676506E+00 0.87761276E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15670000E+02	0.22356719E+02	0.41934415E+01
2	0.41970000E+02	0.18558924E+02	0.18884240E+02
3	0.41960000E+02	0.91043607E+01	0.27455319E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

67152

PROBLEM NO.
TIME = 1.8000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.43308062E+00 0.37807347E+00 0.18884591E+00

PLATE NO. = 1
0.23795874E+00 0.42823182E+00 0.28380944E+00

PLATE NO. = 2
0.20433271E+00 0.43151991E+00 0.36414737E+00

PLATE NO. = 3
0.15784366E+00 0.41928723E+00 0.42286911E+00

REFLUX
0.78917448E-01 0.36824918E+00 0.55283337E+00

TOP PRODUCT
0.78917448E-01 0.36824918E+00 0.55283337E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12969821E+01 0.45365188E+00 0.22665136E+00

TOP PRODUCT RECOVERY FRACTIONS
0.23670300E+00 0.44186366E+00 0.56350921E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.15336871E+01 0.89551554E+00 0.89015756E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15670000E+02	0.21694031E+02	0.39458724E+01
2	0.41070000E+02	0.18903674E+02	0.18412439E+02
3	0.41060000E+02	0.94422954E+01	0.27841689E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

6515G2

PROBLEM NO.
TIME = 2.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.42057487E+00 0.38713185E+00 0.19229328E+00

PLATE NO. = 1
0.27873641E+00 0.43082191E+00 0.29044167E+00

PLATE NO. = 2
0.14985065E+00 0.43495836E+00 0.36519100E+00

PLATE NO. = 3
0.15202610E+00 0.42082457E+00 0.42714933E+00

REFLUX
0.75225413E-01 0.36904046E+00 0.55573412E+00

TOP PRODUCT
0.75225413E-01 0.36904046E+00 0.55573412E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12614723E+01 0.46452106E+00 0.23078856E+00

TOP PRODUCT RECOVERY FRACTIONS
0.22563111E+00 0.44281313E+00 0.56698757E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.14871034E+01 0.90733419E+00 0.89777653E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16070000E+02	0.21026743E+02	0.37612706E+01
2	0.41070000E+02	0.19356592E+02	0.18452063E+02
3	0.41860000E+02	0.96146640E+01	0.27786706E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25151

PROBLEM NO,
TIME = 2.2000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.40874670E+00 0.39339352E+00 0.19785778E+00

PLATE NO, = 1
0.27093499E+00 0.43678288E+00 0.29228213E+00

PLATE NO, = 2
0.19553028E+00 0.43545594E+00 0.36901379E+00

PLATE NO, = 3
0.14685564E+00 0.42319188E+00 0.42995248E+00

REFLUX
0.71863661E-01 0.36939853E+00 0.55873751E+00

TOP PRODUCT
0.71863661E-01 0.36939853E+00 0.55873751E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12260009E+01 0.47203446E+00 0.23746733E+00

TOP PRODUCT RECOVERY FRACTIONS
0.21554787E+00 0.44324278E+00 0.67059647E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.14415486E+01 0.91527724E+00 0.90805999E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.20437435E+02	0.3593183CE+01
2	0.41670000E+02	0.1966967CE+02	0.1646992CE+02
3	0.41660000E+02	0.9892E887E+01	0.2793659CE+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25152

PROBLEM NO.
TIME = 2.4000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.39817393E+00 0.40087870E+00 0.20094737E+00

PLATE NO. = 1
0.26346337E+00 0.43902456E+00 0.29751205E+00

PLATE NO. = 2
0.19189329E+00 0.43808934E+00 0.37001737E+00

PLATE NO. = 3
0.14211272E+00 0.42442570E+00 0.43346158E+00

REFLUX
0.68847395E-01 0.36992609E+00 0.56122652E+00

TOP PRODUCT
0.68847395E-01 0.36992609E+00 0.56122652E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11942629E+01 0.48101596E+00 0.24117544E+00

TOP PRODUCT RECOVERY FRACTIONS
0.20650886E+00 0.44387579E+00 0.67352950E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.14007836E+01 0.92489175E+00 0.91475004E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.19908696E+02	0.34423697E+01
2	0.41070000E+02	0.20043935E+02	0.16496304E+02
3	0.41960000E+02	0.10047369E+02	0.26061346E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25152

PROBLEM NO.
TIME = 2.6000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.38827015E+00 0.40622352E+00 0.20550633E+00

PLATE NO. = 1
0.25705763E+00 0.44368743E+00 0.29925494E+00

PLATE NO. = 2
0.18843038E+00 0.43856592E+00 0.37300370E+00

PLATE NO. = 3
0.13709118E+00 0.42624727E+00 0.43566155E+00

REFLUX
0.66117004E-01 0.37013935E+00 0.56374564E+00

TOP PRODUCT
0.66117004E-01 0.37013935E+00 0.56374564E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11645775E+01 0.48742323E+00 0.24664706E+00

TOP PRODUCT RECOVERY FRACTIONS
0.19831135E+00 0.44413170E+00 0.57660056E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13626389E+01 0.93156092E+00 0.92324759E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.19413507E+02	0.33058932E+01
2	0.41970000E+02	0.20311176E+02	0.18206994E+02
3	0.41360000E+02	0.10275317E+02	0.23187192E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25152

PROBLEM NO.
TIME = 2.8000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.37938677E+00 0.41235995E+00 0.20825328E+00

PLATE NO. = 1
0.25099391E+00 0.44563803E+00 0.30336806E+00

PLATE NO. = 2
0.18547761E+00 0.44058899E+00 0.37393341E+00

PLATE NO. = 3
0.13403609E+00 0.42723952E+00 0.43872440E+00

REFLUX
0.65672456E+01 0.37047448E+00 0.56585507E+00

TOP PRODUCT
0.65672456E+01 0.37047448E+00 0.56585507E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11379327E+01 0.49479255E+00 0.24994393E+00

TOP PRODUCT RECOVERY FRACTIONS
0.19097917E+00 0.44453681E+00 0.67913234E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13239119E+01 0.93932616E+00 0.92907927E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.18969338E+02	0.31336228E+01
2	0.41670000E+02	0.20617997E+02	0.18225724E+02
3	0.41660010E+02	0.10412664E+02	0.28292535E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		

25152

PROBLEM NO.
TIME = 3.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.37112946E+00 0.41689243E+00 0.21197811E+00

PLATE NO. = 1
0.24574412E+00 0.44926250E+00 0.30499338E+00

PLATE NO. = 2
0.18259588E+00 0.44101205E+00 0.37639207E+00

PLATE NO. = 3
0.15060073E+00 0.42862990E+00 0.44076752E+00

REFLUX
0.61456676E+01 0.37058744E+00 0.56794356E+00

TOP PRODUCT
0.61456676E+01 0.37058744E+00 0.56794356E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11151657E+01 0.50023090E+00 0.29441444E+00

TOP PRODUCT RECOVERY FRACTIONS
0.18436615E+00 0.44466936E+00 0.68164413E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.12975289E+01 0.94490025E+00 0.97605537E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.18556473E+02	0.50733538E+01
2	0.41670000E+02	0.20844521E+02	0.18323772E+02
3	0.41660000E+02	0.10598706E+02	0.23697294E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.20000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25155

PROBLEM NO.
TIME = 3.2000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.3637068E+00 0.4214975E+00 0.2143957E+00

PLATE NO. = 1
0.2408256E+00 0.4509517E+00 0.3082253E+00

PLATE NO. = 2
0.1802937E+00 0.4426090E+00 0.3771972E+00

PLATE NO. = 3
0.1274751E+00 0.4294251E+00 0.4430998E+00

REFLUX
0.5749320E+01 0.3707848E+00 0.5697219E+00

TOP PRODUCT
0.5749320E+01 0.3707848E+00 0.5697219E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1090932E+01 0.5062363E+00 0.2973191E+00

TOP PRODUCT RECOVERY FRACTIONS
0.1784439E+00 0.4449062E+00 0.6837755E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1269346E+01 0.9511425E+00 0.9810913E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1667001E+02	0.1618554E+02	0.2974663E+01
2	0.4197000E+02	0.2109466E+02	0.1633334E+02
3	0.4196001E+02	0.1071979E+02	0.2846025E+02
	0.1000000E+03	0.5000000E+02	0.5000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.1000000E+01	0.1000000E+01	0.5000000E+02	0.5000000E+02		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.5000000E+02		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1000000E+03		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1000000E+03		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.5000000E+02		

25157

PROBLEM NO.
TIME = 3.4000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.35684957E+00 0.42571478E+00 0.21743226E+00

PLATE NO. = 1
0.23652428E+00 0.45326033E+00 0.30971539E+00

PLATE NO. = 2
0.17806105E+00 0.44202870E+00 0.37901025E+00

PLATE NO. = 3
0.12408671E+00 0.43047956E+00 0.44463371E+00

REFLUX
0.57715927E+01 0.57082830E+00 0.57146570E+00

TOP PRODUCT
0.57715927E+01 0.57082830E+00 0.57146570E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11703546E+01 0.51081687E+00 0.26096454E+00

TOP PRODUCT RECOVERY FRACTIONS
0.17511516E+00 0.44495846E+00 0.48585927E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.12434476E+01 0.95577533E+00 0.96682131E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16970000E+02	0.17842476E+02	0.28057983E+01
2	0.41970000E+02	0.21265739E+02	0.18941419E+02
3	0.41060000E+02	0.10871780E+02	0.22972598E+02
	0.10000000E+03	0.50000000E+02	0.50000010E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000010E+01	0.10000000E+01	0.99000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

6STG2

PROBLEM NO.
TIME = 3.6000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.3506752E+00 0.4297825E+00 0.2195480E+00

PLATE NO. = 1
0.2323291E+00 0.4552104E+00 0.3122604E+00

PLATE NO. = 2
0.1761158E+00 0.4440482E+00 0.3798359E+00

PLATE NO. = 5
0.1221598E+00 0.4311130E+00 0.4467299E+00

REFLUX
0.5612590E+01 0.3709288E+00 0.5729492E+00

TOP PRODUCT
0.5612590E+01 0.3709288E+00 0.5729492E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1051819E+01 0.5156976E+00 0.2634922E+00

TOP PRODUCT RECOVERY FRACTIONS
0.1683440E+00 0.4456790E+00 0.6676432E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1220132E+01 0.9613768E+00 0.9511392E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1597000E+02	0.1753382E+02	0.2806295E+01
2	0.4197000E+02	0.2140912E+02	0.1892464E+02
3	0.4106000E+02	0.1097704E+02	0.2804722E+02
	0.1000000E+03	0.5000000E+02	0.5000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.1000000E+01	0.1000000E+01	0.2000000E+02	0.5000000E+02		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.5000000E+02		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1200000E+03		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.1200000E+03		
0.1000000E+01	0.1000000E+01	0.1000000E+03	0.5000000E+02		

651542

PROBLEM NO.
TIME = 3.8000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.34500209E+00 0.43297641E+00 0.22202150E+00

PLATE NO. = 1
0.22901481E+00 0.45738552E+00 0.31359967E+00

PLATE NO. = 2
0.17431364E+00 0.44442596E+00 0.38126040E+00

PLATE NO. = 3
0.11969765E+00 0.43190849E+00 0.44819386E+00

REFLUX
0.54695654E+01 0.37092453E+00 0.57437942E+00

TOP PRODUCT
0.54695654E+01 0.37092453E+00 0.57437942E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.10347993E+01 0.51953013E+00 0.20644884E+00

TOP PRODUCT RECOVERY FRACTIONS
0.15405419E+00 0.44507383E+00 0.58936808E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.11988535E+01 0.96460395E+00 0.99583432E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.17250104E+02	0.27347827E+01
2	0.41070000E+02	0.21648820E+02	0.18546266E+02
3	0.41660000E+02	0.11101075E+02	0.28713991E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25160

PROBLEM NO.
TIME = 4.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.33968827E+00 0.43627460E+00 0.22383013E+00

PLATE NO. = 1
0.22577091E+00 0.45861704E+00 0.31561204E+00

PLATE NO. = 2
0.17273580E+00 0.44526193E+00 0.38200227E+00

PLATE NO. = 3
0.11765252E+00 0.43240917E+00 0.44973831E+00

REFLUX
0.53415740E+01 0.37095600E+00 0.57562926E+00

TOP PRODUCT
0.53415740E+01 0.37095600E+00 0.57562926E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.10194639E+01 0.92348765E+00 0.20864034E+00

TOP PRODUCT RECOVERY FRACTIONS
0.18021516E+00 0.44511399E+00 0.69866206E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.11796791E+01 0.96860163E+00 0.99950836E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16971000E+02	0.16994464E+02	0.26707870E+01
2	0.41970000E+02	0.21813730E+02	0.18547900E+02
3	0.41060000E+02	0.11191506E+02	0.28781313E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.90000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.17000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.21000000E+03		

L.T.C.

PROBLEM NO.
TIME = 5.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.32030816E+00 0.44775963E+00 0.23173221E+00

PLATE NO. = 1
0.21366690E+00 0.46452981E+00 0.32158329E+00

PLATE NO. = 2
0.15664892E+00 0.44720543E+00 0.39594555E+00

PLATE NO. = 3
0.11036588E+00 0.43448546E+00 0.45515256E+00

REFLUX
0.48736201E+01 0.37074135E+00 0.58052265E+00

TOP PRODUCT
0.48736201E+01 0.37074135E+00 0.58052265E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.96155220E+00 0.53726858E+00 0.27812516E+00

TOP PRODUCT RECOVERY FRACTIONS
0.14617937E+00 0.44485403E+00 0.69673342E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.11077511E+01 0.98212261E+00 0.97486158E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16970000E+02	0.10026406E+02	0.24563100E+01
2	0.41970000E+02	0.22307982E+02	0.16537057E+02
3	0.41060000E+02	0.11586611E+02	0.29026122E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

5GT52

PROBLEM NO.
TIME = 6.000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.30872115E+00 0.45473037E+00 0.23654848E+00

PLATE NO. = 1
0.20679194E+00 0.46771796E+00 0.32549011E+00

PLATE NO. = 2
0.16339543E+00 0.44837352E+00 0.38823100E+00

PLATE NO. = 3
0.10596720E+00 0.43545929E+00 0.45857351E+00

REFLUX
0.46015577E-01 0.37038719E+00 0.58359723E+00

TOP PRODUCT
0.46015577E-01 0.37038719E+00 0.58359723E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.92597826E+00 0.54563279E+00 0.28390350E+00

TOP PRODUCT RECOVERY FRACTIONS
0.13801913E+00 0.44442907E+00 0.70042675E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.10639974E+01 0.99006187E+00 0.98433235E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.15436057E+02	0.23007758E+01
2	0.41670000E+02	0.22736510E+02	0.18933390E+02
3	0.41660000E+02	0.11827424E+02	0.29173852E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25171

PROBLEM NO.
TIME = 7.0000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.30162568E+00 0.45880695E+00 0.23956738E+00

PLATE NO. = 1
0.20295568E+00 0.46958882E+00 0.32782550E+00

PLATE NO. = 2
0.16135832E+00 0.44894854E+00 0.38969314E+00

PLATE NO. = 3
0.10338820E+00 0.43593192E+00 0.46067987E+00

REFLUX
0.44427813E-01 0.37002289E+00 0.58554929E+00

TOP PRODUCT
0.44427813E-01 0.37002289E+00 0.58554929E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.90469609E+00 0.55052429E+00 0.28752696E+00

TOP PRODUCT RECOVERY FRACTIONS
0.13325679E+00 0.44399195E+00 0.70277150E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.10379529E+01 0.99451625E+00 0.99029946E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16070000E+02	0.15061284E+02	0.22213906E+01
2	0.41070000E+02	0.22940347E+02	0.18301149E+02
3	0.41860000E+02	0.11978369E+02	0.29277465E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25175

PROBLEM NO:
TIME = 6.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.29739060E+00 0.46120269E+00 0.24140671E+00

PLATE NO. = 1
0.20009250E+00 0.47062375E+00 0.32928375E+00

PLATE NO. = 2
0.16015876E+00 0.44926040E+00 0.39058056E+00

PLATE NO. = 3
0.13187256E+00 0.43613128E+00 0.43199615E+00

REFLUX
0.43498043E+01 0.36971676E+00 0.53678319E+00

TOP PRODUCT
0.43498043E+01 0.36971676E+00 0.53678319E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.89199340E+00 0.55339896E+00 0.25973442E+00

TOP PRODUCT RECOVERY FRACTIONS
0.13046304E+00 0.44362463E+00 0.70425492E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.10224614E+01 0.99702558E+00 0.99398735E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.14869530E+02	0.21749022E+01
2	0.41670000E+02	0.23000134E+02	0.18485838E+02
3	0.41660000E+02	0.12070336E+02	0.29339260E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

unesp

PROBLEM NO.
TIME = 8.2000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.29677700E+00 0.46154263E+00 0.24168037E+00

PLATE NO. = 1
0.19973290E+00 0.47077228E+00 0.32949483E+00

PLATE NO. = 2
0.15998375E+00 0.44929850E+00 0.39071775E+00

PLATE NO. = 3
0.10165462E+00 0.43615416E+00 0.46219122E+00

REFLUX
0.43364458E+01 0.36966343E+00 0.58697211E+00

TOP PRODUCT
0.43364458E+01 0.36966343E+00 0.58697211E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.89015297E+00 0.55330685E+00 0.27006486E+00

TOP PRODUCT RECOVERY FRACTIONS
0.13005736E+00 0.44356063E+00 0.70447925E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.10202206E+01 0.99736748E+00 0.99454211E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15670000E+02	0.14838650E+02	0.21582249E+01
2	0.41970000E+02	0.23077131E+02	0.18481171E+02
3	0.41960000E+02	0.12064018E+02	0.29534506E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

***ERR 07512 DSC

25182

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 FORTRAN IV, CD22548.004,     JUL   1967
$JOB      NOLIST,NOCARDS
$PAUSE
CARDS REMAINING IN DECK ARE-


$JOB      NOLIST,NOCARDS
$PAUSE

MAY 25 68      10 31.2
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25183

DC - Resultados Parciais para o Método de Euler,

$\Delta t = 0{,}25$ min.

Formato A 4 - 210x297 mm

INPUT DATA DYNAMIC DISTILLATION HOLLANDS METHOD

NO. OF COMPONENTS	STRIPPING PLATES	RECTIFYING PLATES	REFERENCE COMPONENT
3	1	2	

LIQUID FEED RATE = 9,99999996E+01 VAPOR FEED RATE = 0,00000000E-01 FEED TEMPERATURE = 0,00000000E-01

LIQUID FEED COMPOSITION	VAPOR FEED COMPOSITION	BY COMPONENT
1.66700000E-01	0,00000000E-01	1
4.16699999E-01	0,00000000E-01	2
4.16600000E-01	0,00000000E-01	3

TRAY	TEMPERATURE	VAPOR FLOW RATE	LIQUID FLOW RATE	HOLD UP
-1	0,00000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01
0	1,00000E+00	4,99999998E+01	4,99999998E+01	4,99999998E+01
1	1,00000E+00	9,99999396E+01	4,99999998E+01	4,99999998E+01
2	1,00000E+00	9,99999996E+01	1,49999999E+02	4,99999998E+01
3	1,00000E+00	9,99999996E+01	1,49999999E+02	4,99999998E+01
4	1,00000E+00	9,99999996E+01	4,99999998E+01	4,99999998E+01
5	0,00000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
-1	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
0	0.11070800	0.11070800	0.36151400	0.36151400	0.52777700	0.52777700		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
1	0.23686400	0.11070800	0.38673400	0.36151400	0.37539900	0.52777700		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
2	0.33972500	0.17378700	0.36566000	0.37412500	0.29460800	0.45208800		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
3	0.41866800	0.23194700	0.35764400	0.39627900	0.22368400	0.37177300		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
4	0.55529000	0.35035600	0.30446400	0.38422500	0.14022200	0.26541700		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
5	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000		

EQUILIBRIUM CONSTANTS	COMP.	A1	A2	A3	A4
	1	9.99999999E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01
	2	2.00000000E+00	0.00000000E-01	0.00000000E-01	0.00000000E-01
	3	2.99999999E+00	0.00000000E-01	0.00000000E-01	0.00000000E-01

LIQUID ENTHALPY CONSTANTS	COMP.	C1	C2	C3	C4
	1	0.00000000E-01	0.00000000E-01	0.00000000E-01	0.00000000E-01

unesp

2	0.000000000E-01	0.000000000E-01	0.000000000E-01	0.000000000E-01	
3	0.000000000E-01	0.000000000E-01	0.000000000E-01	0.000000000E-01	D62

VAPOR ENTHALPY CONSTANTS

COMP.	E1	E2	E3	E4
1	0.000000000E-01	0.000000000E-01	0.000000000E-01	0.000000000E-01
2	0.000000000E-01	0.000000000E-01	0.000000000E-01	0.000000000E-01
3	0.000000000E-01	0.000000000E-01	0.000000000E-01	0.000000000E-01

KB BY TRAY

0.0000000
0.4187240
0.4673910
0.5115420
0.5540110
0.6309420
0.0000000

25104

FOR THIS RUN [ELT = 0,25001

SUTSZ

PROBLEM NO.
TIME = 0.2500LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.55529328E+00 0.30448502E+00 0.14022170E+00

PLATE NO. = 1
0.41866938E+00 0.35764561E+00 0.22368501E+00

PLATE NO. = 2
0.25697851E+00 0.40753182E+00 0.33548957E+00

PLATE NO. = 3
0.23686480E+00 0.36673648E+00 0.37639872E+00

REFLUX
0.11070811E+00 0.36151436E+00 0.52777753E+00

TOP PRODUCT
0.11070811E+00 0.36151436E+00 0.52777753E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.16655467E+01 0.36535260E+00 0.16829297E+00

TOP PRODUCT RECOVERY FRACTIONS
0.33205792E+00 0.43378253E+00 0.63343438E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.19976046E+01 0.79913533E+00 0.80172735E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.27754664E+02	0.[illegible]E+01
2	0.41670000E+02	0.1922425[illegible]E+02	0.1807571[illegible]E+02
3	0.41660000E+02	0.70110851E+01	0.26588875E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.[illegible]E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.[illegible]E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25105

PROBLEM NO.
TIME = 0.5000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.53529271E+00 0.30448518E+00 0.14022211E+00

PLATE NO. = 1
0.33650633E+00 0.38703330E+00 0.25466036E+00

PLATE NO. = 2
0.25098677E+00 0.40006331E+00 0.32994992E+00

PLATE NO. = 3
0.21166920E+00 0.39566728E+00 0.39266347E+00

REFLUX
0.11070339E+00 0.36161453E+00 0.52777712E+00

TOP PRODUCT
0.11070339E+00 0.36161453E+00 0.52777712E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13693450E+01 0.36535299E+00 0.15829346E+00

TOP PRODUCT RECOVERY FRACTIONS
0.35205365E+00 0.43378274E+00 0.63843389E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13976037E+01 0.79913573E+00 0.80172735E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15070000E+02	0.27764635E+02	0.2553417GE+01
2	0.41070000E+02	0.15224259E+02	0.18075727E+02
3	0.41660000E+02	0.70111059E+01	0.26588936E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25107

PROBLEM NO.
TIME = 0.7500 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.5062005E+00 0.3290262IE+00 0.1634557 4E+00

PLATE NO. = 1
0.3661495BE+00 0.3913B669E+00 0.2426157 3E+00

PLATE NO. = 2
0.2522B320E+00 0.4167504 1E+00 0.3309613 9E+00

PLATE NO. = 3
0.2009730 3E+00 0.4034272 5E+00 0.3955977 3E+01

REFLUX
0.1038500 3E+00 0.3621752 9E+00 0.5339459 9E+00

TOP PRODUCT
0.1038600 3E+00 0.3621732 8E+00 0.5339469 9E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1522255 1E+01 0.3936999 6E+00 0.1961733 8E+00

TOP PRODUCT RECOVERY FRACTIONS
0.3115777 9E+00 0.4345731 7E+00 0.6408332 6E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1353852 9E+01 0.8281731 5E+00 0.8570144 3E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1697000 0E+02	0.2524600 2E+02	0.6174017 E+01
2	0.4197001 0E+02	0.1640131 0E+02	0.1814469 4E+02
3	0.4106000 0E+02	0.8172467 1E+01	0.2689733 4E+02
	0.1100000 0E+03	0.5000000 0E+02	0.6000000 0E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.1000000 0E+01	0.1100000 0E+01	0.5000000 0E+02	0.5000000 0E+02		
0.1000000 0E+01	0.1100000 0E+01	0.1000000 0E+03	0.5000000 0E+02		
0.1000000 0E+01	0.1100000 0E+01	0.1000000 0E+03	0.1200000 0E+03		
0.1000000 0E+01	0.1100000 0E+01	0.1000000 0E+03	0.1200000 0E+03		
0.1000000 0E+01	0.1100000 0E+01	0.1000000 0E+03	0.5000000 0E+02		

25109

PROBLEM NO.
TIME = 1.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.5026646JE+00 0.5412361bE+00 0.1563972bE+00

PLATE NO. = 1
0.3216272bE+00 0.4003863bE+00 0.2780842bE+00

PLATE NO. = 2
0.2344125bE+00 0.4251877bE+00 0.3404205bE+00

PLATE NO. = 3
0.1357324bE+00 0.4059191bE+00 0.4582755bE+00

REFLUX
0.9772807bE+01 0.3649119bE+00 0.5373599bE+00

TOP PRODUCT
0.9772807bE+01 0.3649119bE+00 0.5373599bE+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1506792bE+01 0.4094506bE+00 0.1077071bE+00

TOP PRODUCT RECOVERY FRACTIONS
0.2981235bE+00 0.4378593bE+00 0.6449321bE+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1799918bE+01 0.8473099bE+00 0.9826442bE+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1697003bE+02	0.2511823bE+02	0.4866035E+01
2	0.4197003bE+02	0.1705130bE+02	0.1824359E+02
3	0.4196003bE+02	0.7819962bE+01	0.2686798E+02
	0.1100003bE+03	0.5000003bE+02	0.6000003E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.1000003bE+01	0.1100003bE+01	0.5000003bE+02	0.5000003E+02		
0.1000003bE+01	0.1100003bE+01	0.1100003bE+03	0.6000003E+02		
0.1000003bE+01	0.1100003bE+01	0.1100003bE+03	0.1200003E+03		
0.1000003bE+01	0.1100003bE+01	0.1100003bE+03	0.1200003E+03		
0.1000003bE+01	0.1100003bE+01	0.1100003bE+03	0.6000003E+02		

6JT52

PROBLEM NO.
TIME = 1.2500 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.46629534E+00 0.34968659E+00 0.18403807E+00

PLATE NO. = 1
0.32536910E+00 0.42070175E+00 0.25342914E+00

PLATE NO. = 2
0.21498324E+00 0.41876653E+00 0.36624313E+00

PLATE NO. = 3
0.17760076E+00 0.41494624E+00 0.40745300E+00

REFLUX
0.90647798E-01 0.36512597E+00 0.54422623E+00

TOP PRODUCT
0.90647798E-01 0.36512597E+00 0.54422623E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13985703E+01 0.41959084E+00 0.22087143E+00

TOP PRODUCT RECOVERY FRACTIONS
0.27188902E+00 0.48811611E+00 0.65317299E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.16704593E+01 0.85770646E+00 0.87404742E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.23314157E+02	0.45523899E+01
2	0.41700000E+02	0.17484530E+02	0.18256227E+02
3	0.41630000E+02	0.92015036E+01	0.27211312E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.12000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25110

PROBLEM NO.
TIME = 1.500LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.45868900E+00 0.37421854E+00 0.16739246E+00

PLATE NO. = 1
0.29390469E+00 0.40456708E+00 0.30152823E+00

PLATE NO. = 2
0.21609811E+00 0.44037299E+00 0.34352890E+00

PLATE NO. = 3
0.15600712E+00 0.41106567E+00 0.42292721E+00

REFLUX
0.85147330E+01 0.36864987E+00 0.54620251E+00

TOP PRODUCT
0.85147330E+01 0.36864987E+00 0.54620281E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.13748920E+01 0.44902652E+00 0.20090310E+00

TOP PRODUCT RECOVERY FRACTIONS
0.25539091E+00 0.44234445E+00 0.65554026E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.16302829E+01 0.89187077E+00 0.85645135E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.22919450E+02	0.42573655E+01
2	0.41070000E+02	0.16710927E+02	0.18432493E+02
3	0.41960000E+02	0.83696231E+01	0.27310150E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25111

PROBLEM NO.
TIME = 1.7500 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.45041010E+00 0.36512031E+00 0.20476959E+00

PLATE NO. = 1
0.29643263E+00 0.44887516E+00 0.25469221E+00

PLATE NO. = 2
0.20128623E+00 0.41575524E+00 0.38295852E+00

PLATE NO. = 3
0.15979201E+00 0.42561584E+00 0.41459215E+00

REFLUX
0.79391018E+01 0.36646061E+00 0.63418837E+00

TOP PRODUCT
0.79391018E+01 0.36646061E+00 0.63418837E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12900723E+01 0.43810952E+00 0.24574284E+00

TOP PRODUCT RECOVERY FRACTIONS
0.23800645E+00 0.43971755E+00 0.66513247E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.15250777E+01 0.87782687E+00 0.91089531E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.21505505E+02	0.39673309E+01
2	0.41700000E+02	0.16256015E+02	0.18523050E+02
3	0.41630000E+02	0.10238480E+02	0.27707419E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.11000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.13000000E+03		
0.10000000E+01	0.11000000E+01	0.10000000E+03	0.50000000E+02		

25112

PROBLEM NO.
TIME = 2.000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.42372600E+00 0.40475575E+00 0.17151825E+00

PLATE NO. = 1
0.27056596E+00 0.40053957E+00 0.32889447E+00

PLATE NO. = 2
0.20317659E+00 0.45727802E+00 0.33954539E+00

PLATE NO. = 3
0.15038548E+00 0.41265656E+00 0.43705794E+00

REFLUX
0.75104533E-01 0.37183206E+00 0.55306340E+00

TOP PRODUCT
0.75104533E-01 0.37183206E+00 0.55306340E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12709238E+01 0.48566805E+00 0.20585434E+00

TOP PRODUCT RECOVERY FRACTIONS
0.22526855E+00 0.44616278E+00 0.56378225E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.14931923E+01 0.93183083E+00 0.76963713E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16970000E+02	0.21136300E+02	0.37952297E+01
2	0.41070000E+02	0.20237787E+02	0.18991503E+02
3	0.41960000E+02	0.85799127E+01	0.27551170E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

PROBLEM NO.
TIME = 2.5000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.39702706E+00 0.43570630E+00 0.16726664E+00

PLATE NO. = 1
0.25058253E+00 0.38460204E+00 0.36481543E+00

PLATE NO. = 2
0.19446151E+00 0.47921814E+00 0.32632036E+00

PLATE NO. = 3
0.13798791E+00 0.41019888E+00 0.45181321E+00

REFLUX
0.67405606E-01 0.37510886E+00 0.55748553E+00

TOP PRODUCT
0.67405606E-01 0.37510886E+00 0.55748553E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11908430E+01 0.52280574E+00 0.20075209E+00

TOP PRODUCT RECOVERY FRACTIONS
0.20217638E+00 0.45009463E+00 0.66908959E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13930194E+01 0.97290037E+00 0.86984178E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.19851353E+02	0.33702803E+01
2	0.41670000E+02	0.21785315E+02	0.18755443E+02
3	0.41660000E+02	0.83633319E+01	0.27874276E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

PROBLEM NO.
TIME = 3.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.37704884E+00 0.47072504E+00 0.15222612E+00

PLATE NO. = 1
0.23282118E+00 0.35121659E+00 0.41594224E+00

PLATE NO. = 2
0.16918296E+00 0.51085866E+00 0.29995839E+00

PLATE NO. = 3
0.12810129E+00 0.40312522E+00 0.46877350E+00

REFLUX
0.61629820E+01 0.37942256E+00 0.55894782E+00

TOP PRODUCT
0.61629820E+01 0.37942256E+00 0.55894782E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11309203E+01 0.56482487E+00 0.14270058E+00

TOP PRODUCT RECOVERY FRACTIONS
0.18465249E+00 0.43527041E+00 0.57084472E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13157728E+01 0.10200953E+01 0.99564350E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.16892442E+02	0.50811910E+01
2	0.41670000E+02	0.23536252E+02	0.18971118E+02
3	0.41660000E+02	0.76113060E+01	0.27947391E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.11000000E+11	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.99000000E+02		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.19000000E+03		
0.10000000E+01	0.11000000E+11	0.10000000E+03	0.50000000E+02		

25117

PROBLEM NO.
TIME = 3.5000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.3629069ZE+00 0.5144095UE+00 0.1226837BE+00

PLATE NO. = 1
0.2159315IE+00 0.2912796bE+00 0.4927888ZE+00

PLATE NO. = 2
0.1871149bE+00 0.5592940bE+00 0.2535907bE+00

PLATE NO. = 3
0.1230908bE+00 0.5899914ZE+00 0.4699177BE+00

REFLUX
0.5742472bE-01 0.5652925BE+00 0.5563450JE+00

TOP PRODUCT
0.5742472bE-01 0.5652925bE+00 0.5563450JE+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1048653UE+01 0.5172417YE+00 0.1472410E+00

TOP PRODUCT RECOVERY FRACTIONS
0.1722597JE+00 0.4654380ZE+00 0.5677220JE+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1250742BE+01 0.1080679BE+01 0.8149691JE+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1697000UE+02	0.1814554bE+02	0.2871233BE+01
2	0.4107000JE+02	0.2572046bE+02	0.1931145ZE+02
3	0.4196000JE+02	0.6154189UE+01	0.2781730JE+02
	0.1000000UE+03	0.5000000UE+02	0.5000000UE+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.1000000UE+01	0.1000000UE+01	0.5000000UE+02	0.5000000UE+02		
0.1000000UE+01	0.1000000UE+01	0.1000000UE+03	0.5000000UE+02		
0.1000000UE+01	0.1000000UE+01	0.1000000UE+03	0.1000000UE+03		
0.1000000UE+01	0.1000000UE+01	0.1000000UE+03	0.1000000UE+03		
0.1000000UE+01	0.1000000UE+01	0.1000000UE+03	0.5000000UE+02		

2519

PROBLEM NO.
TIME = 4.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.35408034E+00 0.5724992bE+00 0.7342040bE-01

PLATE NO. = 1
0.19810014E+00 0.1b910154E+00 0.61279b3bE-00

PLATE NO. = 2
0.1bb62654E+00 0.63642844E+00 0.17494502E+00

PLATE NO. = 3
0.11342b78E+00 0.3b900540E+00 0.51756752E+00

REFLUX
0.5456b415E-01 0.3983017bE+00 0.5471125ZE+00

TOP PRODUCT
0.5456b415E-01 0.3983017bE+00 0.5471125ZE+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.1052b2bbE-01 0.6bb9441bE+00 0.8b11b5bbE-01

TOP PRODUCT RECOVERY FRACTIONS
0.1b372350E+00 0.477023bbE+00 0.65664045E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.1225752lE+01 0.11648b80E+01 0.7447503bE+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.1bb7b000E+02	0.1770401ZE+02	0.27292707E+01
2	0.41b7b000E+02	0.2bb249bbE+02	0.1991350bE+02
3	0.41bb1000E+02	0.3b710203E+01	0.2755b5b1E+02
	0.100000000E+03	0.500000000E+02	0.500000b0E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.100000000E+01	0.100000000E+01	0.500000000E+02	0.500000000E+02		
0.100000000E+01	0.100000000E+01	0.100000000E+03	0.500000000E+02		
0.100000000E+01	0.100000000E+01	0.100000000E+03	0.150000000E+03		
0.100000000E+01	0.100000000E+01	0.100000000E+03	0.150000000E+03		
0.100000000E+01	0.100000000E+01	0.100000000E+03	0.500000000E+02		

25121

PROBLEM NO.
TIME = 5.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.35175257E+00 0.75892435E+00 -0.11067692E+00

PLATE NO. = 1
0.14546602E+00 -0.29951643E+00 0.11538304E+01

PLATE NO. = 2
0.21091273E+00 0.10001227E+01 -0.21063546E+00

PLATE NO. = 3
0.10271496E+00 0.29170053E+00 0.60558451E+00

REFLUX
0.55840427E+01 0.47509136E+00 0.47106822E+00

TOP PRODUCT
0.55840427E+01 0.47509136E+00 0.47106822E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.10590467E+01 0.91063657E+00 -0.15263556E+00

TOP PRODUCT RECOVERY FRACTIONS
0.15148398E+00 0.97006402E+00 0.55537252E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.12165557E+01 0.14997004E+01 0.43293478E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.15970010E+02	0.17587528E+02	0.26922138E+01
2	0.41870010E+02	0.37946217E+02	0.23754558E+02
3	0.41860010E+02	-0.55559462E+01	0.23955841E+02
	0.10000010E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

52752

PROBLEM NO.
TIME = 0.000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.36761115E+00 0.10373204E+01 -0.40497158E+00

PLATE NO. = 1
-0.14940405E+00 -0.39582538E+01 0.51471579E+01

PLATE NO. = 2
0.44164209E+00 0.39547883E+01 -0.34364304E+01

PLATE NO. = 3
0.42462064E-01 -0.11169525E+01 0.20744704E+01

REFLUX
0.14940374E+00 0.24703969E+01 -0.16288006E+01

TOP PRODUCT
0.14940374E+00 0.24703969E+01 -0.16288006E+01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.11126129E+01 0.12446849E+01 -0.48599566E+00

TOP PRODUCT RECOVERY FRACTIONS
0.44812161E+00 0.29750363E+01 -0.19548735E+01

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.15507345E+01 0.42197232E+01 -0.24406652E+01

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.14670000E+02	0.16306556E+02	0.74710171E+01
2	0.41670000E+02	0.51866021E+02	0.12356984E+03
3	0.41000000E+02	-0.20246579E+02	-0.81440131E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25129

PROBLEM NO.
TIME = 7.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.14661515E+01 0.16901829E+02 -0.17367981E+02

PLATE NO. = 1
0.20351011E+00 0.20595445E+01 -0.12630246E+01

PLATE NO. = 2
-0.15122223E+00 -0.46771020E+01 0.58583442E+01

PLATE NO. = 3
-0.66032273E+00 -0.11220755E+02 0.12861077E+02

REFLUX
-0.25743439E+01 -0.11342697E+01 0.21600131E+01

TOP PRODUCT
-0.25743439E+01 -0.11342697E+01 0.21600131E+01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.43975760E+01 0.20280572E+02 -0.20844912E+02

TOP PRODUCT RECOVERY FRACTIONS
-0.77214875E+01 -0.13610148E+01 0.25924506E+01

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.43203811E+01 0.18919957E+02 -0.16252481E+02

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16970000E+02	0.73307591E+02	-0.12871740E+01
2	0.41670000E+02	0.84509143E+03	-0.56713485E+02
3	0.41660000E+02	-0.86859902E+03	0.10800066E+03
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.10000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25T62

PROBLEM NO.
TIME = 6.0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.47152076E+00 0.26316583E+01 -0.21031741E+01

PLATE NO. = 1
-0.13356204E+00 0.32774524E+01 0.44110144E+01

PLATE NO. = 2
0.91156852E+02 -0.15108119E+01 0.25014962E+01

PLATE NO. = 3
-0.18321572E+00 -0.35076512E+01 0.46908559E+01

REFLUX
-0.33862244E+01 0.11991031E+01 0.22329653E+01

TOP PRODUCT
-0.33862244E+01 -0.11991031E+01 0.22329653E+01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.14142795E+01 0.31577314E+01 -0.25242128E+01

TOP PRODUCT RECOVERY FRACTIONS
-0.10156642E+00 0.14388086E+01 0.25799872E+01

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.13127131E+01 0.17189228E+01 0.15577442E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.23576039E+02	-0.16931122E+01
2	0.41070000E+02	0.13158267E+03	-0.59955124E+02
3	0.41060000E+02	-0.10515870E+03	0.11164927E+03
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25127

PROBLEM NO.
TIME = 8.250LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.6637058QE+00 0.40948767E+01 -0.37585825E+01

PLATE NO. = 1
-0.42628696E+00 0.60309154E+01 0.74575023E+01

PLATE NO. = 2
0.2860648 4E+01 -0.12107637E+01 0.21821572E+01

PLATE NO. = 3
-0.1315 3618E+00 0.27565315E+01 0.38860677E+01

REFLUX
-0.30297676E+01 0.11098233E+01 0.21400810E+01

TOP PRODUCT
-0.30297676E+01 0.11098233E+01 0.21400810E+01

BOTTOM PRODUCT RECOVERY FRACTIONS
0.19907193E+01 0.49134590E+01 -0.45110208E+01

TOP PRODUCT RECOVERY FRACTIONS
-0.9075467 E+01 0.13316815E+01 0.22685052E+01

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.18999644E+01 0.35817775E+01 -0.19425126E+01

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.3316529QE+02	-0.1512 [illegible]E+01
2	0.41070000E+02	0.20474383E+03	-0.5549 [illegible]E+02
3	0.41660000E+02	-0.16792912E+03	0.1070 [illegible]E+03
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

25139

DD - Resultados Completos para o Método de Runge-Kutta, $\Delta t=0,1$ min.

INPUT DATA DYNAMIC DISTILLATION HOLLANDS METHOD

NO. OF COMPONENTS	STRIPPING PLATES	RECTIFYING PLATES	REFERENCE COMPONENT
3	1	2	

LIQUID FEED RATE = 9,99999996E+01 VAPOR FEED RATE = 0,00000000E-01 FEED TEMPERATURE = 9,99999999E-01

LIQUID FEED COMPOSITION	VAPOR FEED COMPOSITION	BY COMPONENT
1,66700000E-01	0,00000000E-01	1
4,16699999E-01	0,00000000E-01	2
4,16600000E-01	0,00000000E-01	3

TRAY	TEMPERATURE	VAPOR FLOW RATE	LIQUID FLOW RATE	HOLD UP
-1	0,000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01
0	1,000000E+00	4,99999998E+01	4,99999998E+01	4,99999998E+01
1	1,000000E+00	9,99999996E+01	4,99999998E+01	4,99999996E+01
2	1,000000E+00	9,99999996E+01	1,49999999E+02	4,99999998E+01
3	1,000000E+00	9,99999996E+01	1,49999999E+02	4,99999998E+01
4	1,000000E+00	9,99999996E+01	4,99999998E+01	4,99999998E+01
5	0,000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
-1	0,00000000	0,00000000	0,00000000	0,00000000	0,00000000	0,00000000		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
0	0,11070800	0,11070800	0,36151400	0,36151400	0,52777700	0,52777700		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
1	0,23686400	0,11070800	0,38673600	0,36151400	0,37639800	0,52777700		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
2	0,33972800	0,17378700	0,36568000	0,37412500	0,29458800	0,45208800		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
3	0,41866800	0,23194700	0,35764400	0,39627900	0,22368400	0,37177300		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
4	0,55529000	0,35035600	0,30448400	0,38422500	0,14022200	0,26541700		

COMPOSITIONS

	C1		C2		C3		C4	
TRAY	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR	LIQUID	VAPOR
5	0,00000000	0,00000000	0,00000000	0,00000000	0,00000000	0,00000000		

EQUILIBRIUM CONSTANTS	COMP.	A1	A2	A3	A4
	1	9,99999999E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01
	2	2,00000000E+00	0,00000000E-01	0,00000000E-01	0,00000000E-01
	3	2,99999999E+00	0,00000000E-01	0,00000000E-01	0,00000000E-01

LIQUID ENTHALPY CONSTANTS	COMP.	C1	C2	C3	C4
	1	0,00000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01

25629

2	0,00000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01	
3	0,00000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01	D83

VAPOR ENTHALPY CONSTANTS

COMP,	E1	E2	E3	E4
1	0,00000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01
2	0,00000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01
3	0,00000000E-01	0,00000000E-01	0,00000000E-01	0,00000000E-01

KB BY TRAY

0,00000000
0,41372400
0,46739100
0,51154200
0,55401100
0,63094200
0,00000000

35629

FOR THIS RUN DELT = 0,10001

3956.0

PROBLEM NO,
TIME = 0,1000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,55470553E+00 0,30480054E+00 0,14049392E+00

PLATE NO, = 1
0,41356537E+00 0,36029425E+00 0,22614038E+00

PLATE NO, = 2
0,31267739E+00 0,37962473E+00 0,30769788E+00

PLATE NO, = 3
0,23502369E+00 0,38737402E+00 0,37760229E+00

REFLUX
0,11064309E+00 0,36152082E+00 0,52783610E+00

TOP PRODUCT
0,11064309E+00 0,36152082E+00 0,52783610E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,16637838E+01 0,36573140E+00 0,16861959E+00

TOP PRODUCT RECOVERY FRACTIONS
0,33186289E+00 0,43379028E+00 0,53350468E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,19956467E+01 0,79952167E+00 0,80212437E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,27735276E+02	0,55321543E+01
2	0,41670000E+02	0,15240027E+02	0,18076041E+02
3	0,41660000E+02	0,70246962E+01	0,26391805E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

13963

PROBLEM NO,
TIME = 0,2000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,55220702E+00 0,30617821E+00 0,14161477E+00

PLATE NO, = 1
0,40513900E+00 0,36480883E+00 0,23005217E+00

PLATE NO, = 2
0,29361783E+00 0,38949843E+00 0,31688375E+00

PLATE NO, = 3
0,23109377E+00 0,38894703E+00 0,37995920E+00

REFLUX
0,11028421E+00 0,36157156E+00 0,52814424E+00

TOP PRODUCT
0,11028421E+00 0,36157156E+00 0,52814424E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,16562898E+01 0,36738447E+00 0,16996492E+00

TOP PRODUCT RECOVERY FRACTIONS
0,33078646E+00 0,43385116E+00 0,63387451E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,19870763E+01 0,80123563E+00 0,80383942E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,27610351E+02	0,55142103E+01
2	0,41670000E+02	0,15308911E+02	0,18678578E+02
3	0,41660000E+02	0,70807385E+01	0,26407212E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

23965

PROBLEM NO,
TIME = 0,3000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,54787385E+00 0,30864113E+00 0,14348502E+00

PLATE NO, = 1
0,39555968E+00 0,36998111E+00 0,23445921E+00

PLATE NO, = 2
0,27954590E+00 0,39676355E+00 0,32369056E+00

PLATE NO, = 3
0,22612608E+00 0,39100556E+00 0,38286836E+00

REFLUX
0,10954060E+00 0,36170434E+00 0,52875505E+00

TOP PRODUCT
0,10954060E+00 0,36170434E+00 0,52875505E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,16432929E+01 0,37033973E+00 0,17220958E+00

TOP PRODUCT RECOVERY FRACTIONS
0,32855609E+00 0,43401049E+00 0,63460760E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,19718490E+01 0,80435022E+00 0,80681718E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,27393692E+02	0,54770300E+01
2	0,41670000E+02	0,15432056E+02	0,18065217E+02
3	0,41660000E+02	0,71742510E+01	0,26437753E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

25853

PROBLEM NO,
TIME = 0,4000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,54206065E+00 0,31201854E+00 0,14592081E+00

PLATE NO, = 1
0,38582031E+00 0,37524418E+00 0,23693551E+00

PLATE NO, = 2
0,26867565E+00 0,40231906E+00 0,32900529E+00

PLATE NO, = 3
0,22070582E+00 0,39328602E+00 0,38600816E+00

REFLUX
0,10841750E+00 0,36192810E+00 0,52965439E+00

TOP PRODUCT
0,10841750E+00 0,36192810E+00 0,52965439E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,16258568E+01 0,37439230E+00 0,17513299E+00

TOP PRODUCT RECOVERY FRACTIONS
0,32518748E+00 0,43427898E+00 0,63568698E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,19510443E+01 0,80867128E+00 0,81081997E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,27103033E+02	0,54208752E+01
2	0,41670000E+02	0,15600927E+02	0,18096605E+02
3	0,41660000E+02	0,72960402E+01	0,26482719E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

29654

PROBLEM NO,
TIME = 0,5000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,53516644E+00 0,31608996E+00 0,14874360E+00

PLATE NO, = 1
0,37634739E+00 0,38035144E+00 0,24330117E+00

PLATE NO, = 2
0,25992923E+00 0,40672293E+00 0,33334784E+00

PLATE NO, = 3
0,21516128E+00 0,39563342E+00 0,38920530E+00

REFLUX
0,10696289E+00 0,36223608E+00 0,53080103E+00

TOP PRODUCT
0,10696289E+00 0,36223608E+00 0,53080103E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,16051783E+01 0,37927761E+00 0,17852059E+00

TOP PRODUCT RECOVERY FRACTIONS
0,32062450E+00 0,43464852E+00 0,53706317E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,19260028E+01 0,81392613E+00 0,81558406E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,26758322E+02	0,53481444E+01
2	0,41670000E+02	0,15804498E+02	0,16111804E+02
3	0,41660000E+02	0,74371801E+01	0,26540052E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

55655

PROBLEM NO,
TIME = 0,6000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,52754476E+00 0,32064728E+00 0,15180796E+00

PLATE NO, = 1
0,36730266E+00 0,38521007E+00 0,24748728E+00

PLATE NO, = 2
0,25264120E+00 0,41032812E+00 0,33703068E+00

PLATE NO, = 3
0,20967452E+00 0,39795790E+00 0,39236758E+00

REFLUX
0,10523968E+00 0,36261402E+00 0,53214630E+00

TOP PRODUCT
0,10523968E+00 0,36261402E+00 0,53214630E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,15823178E+01 0,38474596E+00 0,18219871E+00

TOP PRODUCT RECOVERY FRACTIONS
0,31565592E+00 0,43510201E+00 0,53867775E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,18979737E+01 0,81984797E+00 0,92087646E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,26377238E+02	0,52619542E+01
2	0,41670000E+02	0,16032364E+02	0,18130701E+02
3	0,41660000E+02	0,75903982E+01	0,26607315E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

39535

PROBLEM NO.
TIME = 0,7000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,51947865E+00 0,32551670E+00 0,15500465E+00

PLATE NO. = 1
0,35872938E+00 0,38979712E+00 0,25147351E+00

PLATE NO. = 2
0,24639032E+00 0,41336304E+00 0,34024664E+00

PLATE NO. = 3
0,20434329E+00 0,40020911E+00 0,39544760E+00

REFLUX
0,10331183E+00 0,36304507E+00 0,53364310E+00

TOP PRODUCT
0,10331183E+00 0,36304507E+00 0,53364310E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,15581243E+01 0,39058879E+00 0,18603535E+00

TOP PRODUCT RECOVERY FRACTIONS
0,30987352E+00 0,43561924E+00 0,54047419E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,18679976E+01 0,82620803E+00 0,82650954E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,25973932E+02	0,51655915E+01
2	0,41670000E+02	0,16275835E+02	0,18152254E+02
3	0,41660000E+02	0,77502326E+01	0,26682155E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

unesp

PROBLEM NO,
TIME = 0,8000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,51118253E+00 0,33056213E+00 0,15825535E+00

PLATE NO, = 1
0,35062121E+00 0,39411890E+00 0,25525988E+00

PLATE NO, = 2
0,24090319E+00 0,41597883E+00 0,34311799E+00

PLATE NO, = 3
0,19921655E+00 0,40236074E+00 0,39842271E+00

REFLUX
0,10123778E+00 0,36351255E+00 0,53524967E+00

TOP PRODUCT
0,10123778E+00 0,36351255E+00 0,53524967E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,15332409E+01 0,39664282E+00 0,18993680E+00

TOP PRODUCT RECOVERY FRACTIONS
0,30365261E+00 0,43618017E+00 0,64240239E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,18368935E+01 0,83282299E+00 0,83233919E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,25559126E+02	0,50618890E+01
2	0,41670000E+02	0,16528106E+02	0,18175627E+02
3	0,41660000E+02	0,79127673E+01	0,26762483E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

59665

PROBLEM NO,
TIME = 0,9000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,50281326E+00 0,33568116E+00 0,16150558E+00

PLATE NO, = 1
0,34295360E+00 0,39819212E+00 0,25885427E+00

PLATE NO, = 2
0,23599791E+00 0,41827770E+00 0,34572439E+00

PLATE NO, = 3
0,19431531E+00 0,40440100E+00 0,40128359E+00

REFLUX
0,99067952E-01 0,36400136E+00 0,53693068E+00

TOP PRODUCT
0,99067952E-01 0,36400136E+00 0,53693068E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,15081381E+01 0,40278517E+00 0,19383772E+00

TOP PRODUCT RECOVERY FRACTIONS
0,29714443E+00 0,43676670E+00 0,54441993E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,18052826E+01 0,83955186E+00 0,83825754E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0,25140663E+02	0,49533976E+01
2	0.41670000E+02	0,16784058E+02	0,18200068E+02
3	0.41660000E+02	0,80752792E+01	0,26846534E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

6956

PROBLEM NO,
TIME = 1,0000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,49448281E+00 0,34079880E+00 0,16471839E+00

PLATE NO, = 1
0,33569731E+00 0,40203565E+00 0,26226704E+00

PLATE NO, = 2
0,23195057E+00 0,42033017E+00 0,34811926E+00

PLATE NO, = 3
0,18964477E+00 0,40632665E+00 0,40402857E+00

REFLUX
0,96844232E-01 0,36449867E+00 0,53865710E+00

TOP PRODUCT
0,96844232E-01 0,36449867E+00 0,53865710E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,14831518E+01 0,40892585E+00 0,19769370E+00

TOP PRODUCT RECOVERY FRACTIONS
0,29047460E+00 0,43736341E+00 0,54649196E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,17736264E+01 0,84628926E+00 0,84418566E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,24724140E+02	0,48422116E+01
2	0,41670000E+02	0,17039940E+02	0,18224933E+02
3	0,41660000E+02	0,82359195E+01	0,26932855E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

3564

PROBLEM NO,
TIME = 1,1000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,48626947E+00 0,34586132E+00 0,16786921E+00

PLATE NO, = 1
0,32862381E+00 0,40566732E+00 0,26550886E+00

PLATE NO, = 2
0,22747474E+00 0,42218584E+00 0,35033942E+00

PLATE NO, = 3
0,18520155E+00 0,40813941E+00 0,40665904E+00

REFLUX
0,94600478E-01 0,36499400E+00 0,54040552E+00

TOP PRODUCT
0,94600478E-01 0,36499400E+00 0,54040552E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,14585167E+01 0,41500039E+00 0,20147529E+00

TOP PRODUCT RECOVERY FRACTIONS
0,28374469E+00 0,43795776E+00 0,64859040E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,17422614E+01 0,85295815E+00 0,85006569E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,24313473E+02	0,47300239E+01
2	0,41670000E+02	0,17293066E+02	0,18249700E+02
3	0,41660000E+02	0,83934605E+01	0,27020276E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

1956

PROBLEM NO,
TIME = 1,2000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,47822684E+00 0,35083098E+00 0,17094218E+00

PLATE NO, = 1
0,32230711E+00 0,40910298E+00 0,26858992E+00

PLATE NO, = 2
0,22370863E+00 0,42388027E+00 0,35241110E+00

PLATE NO, = 3
0,18097781E+00 0,40984363E+00 0,40917856E+00

REFLUX
0,92363447E-01 0,36547920E+00 0,54215736E+00

TOP PRODUCT
0,92363447E-01 0,36547920E+00 0,54215736E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,14343936E+01 0,42096350E+00 0,20516344E+00

TOP PRODUCT RECOVERY FRACTIONS
0,27703494E+00 0,43853995E+00 0,55069294E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,17114286E+01 0,85950345E+00 0,85585638E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,23911342E+02	0,46181723E+01
2	0,41670000E+02	0,17541549E+02	0,18273950E+02
3	0,41660000E+02	0,85471090E+01	0,27107868E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

39962

PROBLEM NO,
TIME = 1,3000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,47039073E+00 0,35568184E+00 0,17392743E+00

PLATE NO, = 1
0,31612397E+00 0,41235638E+00 0,27151965E+00

PLATE NO, = 2
0,22020704E+00 0,42543944E+00 0,35435352E+00

PLATE NO, = 3
0,17696373E+00 0,41144494E+00 0,41159134E+00

REFLUX
0,90153851E-01 0,36594811E+00 0,54389804E+00

TOP PRODUCT
0,90153851E-01 0,36594811E+00 0,54389804E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,14108900E+01 0,42678407E+00 0,20874632E+00

TOP PRODUCT RECOVERY FRACTIONS
0,27040747E+00 0,43910260E+00 0,65278209E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,16812975E+01 0,86588667E+00 0,86152842E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,23519536E+02	0,45076925E+01
2	0,41670000E+02	0,17784092E+02	0,18297405E+02
3	0,41660000E+02	0,86963717E+01	0,27194902E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

27952

PROBLEM NO,
TIME = 1,4000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,46278418E+00 0,36039659E+00 0,17681923E+00

PLATE NO, = 1
0,31025374E+00 0,41543951E+00 0,27430676E+00

PLATE NO, = 2
0,21693602E+00 0,42688274E+00 0,35618125E+00

PLATE NO, = 3
0,17314879E+00 0,41294945E+00 0,41390177E+00

REFLUX
0,87987381E-01 0,36639634E+00 0,54561628E+00

TOP PRODUCT
0,87987381E-01 0,36639634E+00 0,54561628E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,13880749E+01 0,43244132E+00 0,21221703E+00

TOP PRODUCT RECOVERY FRACTIONS
0,26390936E+00 0,43964043E+00 0,65484432E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,16519843E+01 0,87208175E+00 0,86706135E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,23139209E+02	0,43993690E+01
2	0,41670000E+02	0,18019830E+02	0,18319817E+02
3	0,41660000E+02	0,88409614E+01	0,27280814E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

39644

PROBLEM NO,
TIME = 1,5000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,45542116E+00 0,36496420E+00 0,17961464E+00

PLATE NO, = 1
0,30467791E+00 0,41836284E+00 0,27695925E+00

PLATE NO, = 2
0,21386944E+00 0,42822489E+00 0,35790567E+00

PLATE NO, = 3
0,16952254E+00 0,41436329E+00 0,41611418E+00

REFLUX
0,85875633E+01 0,36682090E+00 0,54730347E+00

TOP PRODUCT
0,85875633E+01 0,36682090E+00 0,54730347E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,13659903E+01 0,43792201E+00 0,21557206E+00

TOP PRODUCT RECOVERY FRACTIONS
0,25757539E+00 0,44014987E+00 0,65686926E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,16235657E+01 0,87807187E+00 0,87244132E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,22771058E+02	0,42937816E+01
2	0,41670000E+02	0,18248210E+02	0,18341045E+02
3	0,41660000E+02	0,89807319E+01	0,27365173E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

579652

PROBLEM NO,
TIME = 1,6000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,44830920E+00 0,36937815E+00 0,18231256E+00

PLATE NO, = 1
0,29937977E+00 0,42113571E+00 0,27948452E+00

PLATE NO, = 2
0,21098668E+00 0,42947738E+00 0,35953593E+00

PLATE NO, = 3
0,16607495E+00 0,41569234E+00 0,41823272E+00

REFLUX
0,83826915E-01 0,36721998E+00 0,54895310E+00

TOP PRODUCT
0,83826915E-01 0,36721998E+00 0,54895310E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,13446587E+01 0,44321832E+00 0,21881020E+00

TOP PRODUCT RECOVERY FRACTIONS
0,25143046E+00 0,44062873E+00 0,65884914E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,15960891E+01 0,88384705E+00 0,87765934E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,22415460E+02	0,41913457E+01
2	0,41670000E+02	0,18468907E+02	0,18360999E+02
3	0,41660000E+02	0,91156329E+01	0,27447655E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

97562

PROBLEM NO.
TIME = 1,7000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,44145122E+00 0,37363519E+00 0,18491358E+00

PLATE NO, = 1
0,29434406E+00 0,42376652E+00 0,28188942E+00

PLATE NO, = 2
0,20827107E+00 0,43064933E+00 0,36107960E+00

PLATE NO, = 3
0,16279657E+00 0,41694212E+00 0,42026131E+00

REFLUX
0,81846913E-01 0,36759265E+00 0,55056043E+00

TOP PRODUCT
0,81846913E-01 0,36759265E+00 0,55056043E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,13240889E+01 0,44832637E+00 0,22193181E+00

TOP PRODUCT RECOVERY FRACTIONS
0,24549164E+00 0,44107590E+00 0,56077825E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,15695805E+01 0,88940227E+00 0,88271006E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,22072561E+02	0,40923456E+01
2	0,41670000E+02	0,18681760E+02	0,18379633E+02
3	0,41660000E+02	0,92456791E+01	0,27528022E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

23647

PROBLEM NO,
TIME = 1,8000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,43484696E+00 0,37773445E+00 0,18741859E+00

PLATE NO, = 1
0,28955675E+00 0,42626294E+00 0,28418031E+00

PLATE NO, = 2
0,20570878E+00 0,43174816E+00 0,36254306E+00

PLATE NO, = 3
0,15967856E+00 0,41811776E+00 0,42220358E+00

REFLUX
0,79939254E-01 0,36793869E+00 0,55212206E+00

TOP PRODUCT
0,79939254E-01 0,36793869E+00 0,55212206E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,13042800E+01 0,45324508E+00 0,22493830E+00

TOP PRODUCT RECOVERY FRACTIONS
0,23976961E+00 0,44149111E+00 0,66265250E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,15440498E+01 0,89473618E+00 0,88759079E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,21742348E+02	0,39969627E+01
2	0,41670000E+02	0,18886722E+02	0,18396934E+02
3	0,41660000E+02	0,93709295E+01	0,27606103E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

79549

PROBLEM NO,
TIME = 1,9000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,42849386E+00 0,38167670E+00 0,18982944E+00

PLATE NO, = 1
0,28500484E+00 0,42863203E+00 0,28636313E+00

PLATE NO, = 2
0,20328815E+00 0,43278001E+00 0,36393184E+00

PLATE NO, = 3
0,15671269E+00 0,41922398E+00 0,42406332E+00

REFLUX
0,78105958E-01 0,36825837E+00 0,55363568E+00

TOP PRODUCT
0,78105958E-01 0,36825837E+00 0,55363568E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,12852245E+01 0,45797541E+00 0,22783178E+00

TOP PRODUCT RECOVERY FRACTIONS
0,23427102E+00 0,44187469E+00 0,66446913E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,15194955E+01 0,89985010E+00 0,89230091E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,21424693E+02	0,39052979E+01
2	0,41670000E+02	0,19063835E+02	0,1841291BE+02
3	0,41660000E+02	0,94914721E+01	0,27681784E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

679662

PROBLEM NO,
TIME = 2,0000 LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,42236775E+00 0,38546397E+00 0,19214829E+00

PLATE NO, = 1
0,28067619E+00 0,43086037E+00 0,28844344E+00

PLATE NO, = 2
0,20099910E+00 0,43375012E+00 0,36525078E+00

PLATE NO, = 3
0,15389130E+00 0,42026513E+00 0,42584357E+00

REFLUX
0,76347798E+01 0,36855236E+00 0,55509985E+00

TOP PRODUCT
0,76347798E+01 0,36855236E+00 0,55509985E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,12669099E+01 0,46251976E+00 0,23061485E+00

TOP PRODUCT RECOVERY FRACTIONS
0,22890759E+00 0,44222745E+00 0,66622641E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,14959074E+01 0,90474721E+00 0,89684126E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,21119387E+02	0,38173899E+01
2	0,41670000E+02	0,19273198E+02	0,18427618E+02
3	0,41660000E+02	0,96074145E+01	0,27754992E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

0396

PROBLEM NO,
TIME = 2,1000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,41652337E+00 0,38909910E+00 0,19437753E+00

PLATE NO, = 1
0,27655945E+00 0,43301412E+00 0,29042642E+00

PLATE NO, = 2
0,19883282E+00 0,43466299E+00 0,36650419E+00

PLATE NO, = 3
0,15120722E+00 0,42124519E+00 0,42754759E+00

REFLUX
0,74664599E+01 0,36882158E+00 0,55651382E+00

TOP PRODUCT
0,74664599E+01 0,36882158E+00 0,55651382E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,12493202E+01 0,46688157E+00 0,23329036E+00

TOP PRODUCT RECOVERY FRACTIONS
0,22394901E+00 0,44255049E+00 0,66792345E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,14732693E+01 0,90943206E+00 0,90121382E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,20826168E+02	0,37332299E+01
2	0,41670000E+02	0,19454955E+02	0,18441079E+02
3	0,41660000E+02	0,97188765E+01	0,27825691E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

1965

PROBLEM NO,
TIME = 2,2000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,41089471E+00 0,39258557E+00 0,19651972E+00

PLATE NO, = 1
0,27264396E+00 0,43503907E+00 0,29231697E+00

PLATE NO, = 2
0,19678147E+00 0,43552257E+00 0,36769596E+00

PLATE NO, = 3
0,14865373E+00 0,42216786E+00 0,42917841E+00

REFLUX
0,73055465E-01 0,36906714E+00 0,55787739E+00

TOP PRODUCT
0,73055465E-01 0,36906714E+00 0,55787739E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,12324377E+01 0,47106500E+00 0,23586140E+00

TOP PRODUCT RECOVERY FRACTIONS
0,21912257E+00 0,44284514E+00 0,56956000E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,14515602E+01 0,91391015E+00 0,90542140E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,20544736E+02	0,36527733E+01
2	0,41670000E+02	0,19429279E+02	0,18453357E+02
3	0,41660000E+02	0,98259857E+01	0,27893870E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

23952

PROBLEM NO.
TIME = 2.3000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0.40549525E+00 0.39592727E+00 0.19857747E+00

PLATE NO. = 1
0.26891965E+00 0.43696069E+00 0.29411956E+00

PLATE NO. = 2
0.19483801E+00 0.43633238E+00 0.36882952E+00

PLATE NO. = 3
0.14622452E+00 0.42303654E+00 0.43073894E+00

REFLUX
0.71518967E-01 0.36929025E+00 0.55919078E+00

TOP PRODUCT
0.71518967E-01 0.36929025E+00 0.55919078E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0.12162425E+01 0.47507472E+00 0.23833110E+00

TOP PRODUCT RECOVERY FRACTIONS
0.21451400E+00 0.44311285E+00 0.67113632E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1.0 AT STEADY STATE
0.14307565E+01 0.91818758E+00 0.90946742E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0.16670000E+02	0.20274763E+02	0.35759483E+01
2	0.41670000E+02	0.19796364E+02	0.18464513E+02
3	0.41660000E+02	0.09288737E+01	0.27959539E+02
	0.10000000E+03	0.50000000E+02	0.50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0.10000000E+01	0.10000000E+01	0.50000000E+02	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.15000000E+03		
0.10000000E+01	0.10000000E+01	0.10000000E+03	0.50000000E+02		

PROBLEM NO,
TIME = 2,4000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,40031816E+00 0,39912836E+00 0,20055348E+00

PLATE NO, = 1
0,26537704E+00 0,43878416E+00 0,29583881E+00

PLATE NO, = 2
0,19299602E+00 0,43709558E+00 0,36990840E+00

PLATE NO, = 3
0,14391365E+00 0,42385438E+00 0,43223197E+00

REFLUX
0,70053281E+01 0,36949218E+00 0,56045454E+00

TOP PRODUCT
0,70053281E+01 0,36949218E+00 0,56045454E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,12007143E+01 0,47891572E+00 0,24070269E+00

TOP PRODUCT RECOVERY FRACTIONS
0,21011782E+00 0,44335515E+00 0,67265307E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,14108322E+01 0,92227087E+00 0,91335576E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,20015908E+02	0,35026640E+01
2	0,41670000E+02	0,19956418E+02	0,18474609E+02
3	0,41660000E+02	0,10027674E+02	0,28022727E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

23554

PROBLEM NO,
TIME = 2,5000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,39535641E+00 0,40219318E+00 0,20245041E+00

PLATE NO, = 1
0,26200713E+00 0,44051438E+00 0,29747849E+00

PLATE NO, = 2
0,19124965E+00 0,43781506E+00 0,37093530E+00

PLATE NO, = 3
0,14171547E+00 0,42462434E+00 0,43366019E+00

REFLUX
0,68656307E+01 0,36967423E+00 0,56166947E+00

TOP PRODUCT
0,68656307E+01 0,36967423E+00 0,56166947E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11858321E+01 0,48259321E+00 0,24297937E+00

TOP PRODUCT RECOVERY FRACTIONS
0,20592774E+00 0,44357359E+00 0,67411122E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,13917598E+01 0,92616679E+00 0,91709059E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,19757820E+02	0,34328153E+01
2	0,41670000E+02	0,20109659E+02	0,18463711E+02
3	0,41660000E+02	0,10122521E+02	0,28053473E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

55555

PROBLEM NO,
TIME = 2,6000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,39060290E+00 0,40512618E+00 0,20427092E+00

PLATE NO, = 1
0,25860145E+00 0,44215602E+00 0,29904254E+00

PLATE NO, = 2
0,18959349E+00 0,43849345E+00 0,37191306E+00

PLATE NO, = 3
0,13962466E+00 0,42534914E+00 0,43502621E+00

REFLUX
0,67325755E-01 0,36983766E+00 0,56283659E+00

TOP PRODUCT
0,67325755E-01 0,36983766E+00 0,56283659E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11715744E+01 0,48611252E+00 0,24516433E+00

TOP PRODUCT RECOVERY FRACTIONS
0,20193688E+00 0,44376969E+00 0,57551199E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,13735113E+01 0,92988222E+00 0,92067632E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,19530145E+02	0,33662877E+01
2	0,41670000E+02	0,20256309E+02	0,18491883E+02
3	0,41660000E+02	0,10213546E+02	0,26141829E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

3965

PROBLEM NO,
TIME = 2,7000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,38605053E+00 0,40793184E+00 0,20601764E+00

PLATE NO, = 1
0,25575191E+00 0,44371350E+00 0,30053459E+00

PLATE NO, = 2
0,18802255E+00 0,43913318E+00 0,37284427E+00

PLATE NO, = 3
0,13763612E+00 0,42603135E+00 0,43633253E+00

REFLUX
0,66059212E+01 0,36998375E+00 0,56395704E+00

TOP PRODUCT
0,66059212E+01 0,36998375E+00 0,56395704E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11579200E+01 0,48947905E+00 0,24726073E+00

TOP PRODUCT RECOVERY FRACTIONS
0,19813801E+00 0,44394498E+00 0,57685675E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,13560580E+01 0,93342403E+00 0,92411747E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,19302526E+02	0,33029606E+01
2	0,41670000E+02	0,20396592E+02	0,18499187E+02
3	0,41660000E+02	0,10300882E+02	0,28197852E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

45932

PROBLEM NO,
TIME = 2,8000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,38169221E+00 0,41061465E+00 0,20769314E+00

PLATE NO, = 1
0,25285089E+00 0,44519104E+00 0,30195807E+00

PLATE NO, = 2
0,18653216E+00 0,43973651E+00 0,37373132E+00

PLATE NO, = 3
0,13574503E+00 0,42667339E+00 0,43758158E+00

REFLUX
0,64854200E+01 0,37011370E+00 0,36503210E+00

TOP PRODUCT
0,64854200E+01 0,37011370E+00 0,36503210E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11448477E+01 0,49269817E+00 0,24927155E+00

TOP PRODUCT RECOVERY FRACTIONS
0,19452370E+00 0,44410091E+00 0,57814703E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,13393714E+01 0,93679908E+00 0,92741857E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,19084610E+02	0,32427100E+01
2	0,41670000E+02	0,20530733E+02	0,18505685E+02
3	0,41660000E+02	0,10384657E+02	0,28251605E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

55552

PROBLEM NO,
TIME = 2,9000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,37752096E+00 0,41317909E+00 0,20929995E+00

PLATE NO, = 1
0,25009114E+00 0,44659265E+00 0,30331622E+00

PLATE NO, = 2
0,18511798E+00 0,44030555E+00 0,37457647E+00

PLATE NO, = 3
0,13394679E+00 0,42727751E+00 0,43877570E+00

REFLUX
0,63708213E+01 0,37022868E+00 0,56606311E+00

TOP PRODUCT
0,63708213E+01 0,37022868E+00 0,56606311E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11323364E+01 0,49577525E+00 0,25120013E+00

TOP PRODUCT RECOVERY FRACTIONS
0,19108642E+00 0,44423888E+00 0,57938443E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,13234228E+01 0,94001412E+00 0,93058456E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,18876048E+02	0,31854107E+01
2	0,41670000E+02	0,20458954E+02	0,18511434E+02
3	0,41660000E+02	0,10464997E+02	0,28303155E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

6959

PROBLEM NO,
TIME = 3,0000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,37352991E+00 0,41562955E+00 0,21084054E+00

PLATE NO, = 1
0,24746576E+00 0,44792212E+00 0,30461212E+00

PLATE NO, = 2
0,18377594E+00 0,44084226E+00 0,37538181E+00

PLATE NO, = 3
0,13223699E+00 0,42784585E+00 0,43991716E+00

REFLUX
0,62618749E+01 0,37032980E+00 0,36705145E+00

TOP PRODUCT
0,62618749E+01 0,37032980E+00 0,36705145E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11203657E+01 0,49871556E+00 0,25304914E+00

TOP PRODUCT RECOVERY FRACTIONS
0,18781869E+00 0,44436022E+00 0,58057053E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,13081844E+01 0,94307578E+00 0,93361977E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,18676496E+02	0,31309375E+01
2	0,41670000E+02	0,20781477E+02	0,18516490E+02
3	0,41660000E+02	0,10542027E+02	0,28352572E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

69969

PROBLEM NO,
TIME = 3,1000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,36971232E+00 0,41797036E+00 0,21231732E+00

PLATE NO, = 1
0,24496822E+00 0,44918309E+00 0,30584858E+00

PLATE NO, = 2
0,18250221E+00 0,44134847E+00 0,37614933E+00

PLATE NO, = 3
0,13061145E+00 0,42838041E+00 0,44100815E+00

REFLUX
0,61583334E-01 0,37041812E+00 0,56799855E+00

TOP PRODUCT
0,61583334E-01 0,37041812E+00 0,56799855E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,11089152E+01 0,50152431E+00 0,25482156E+00

TOP PRODUCT RECOVERY FRACTIONS
0,18471306E+00 0,44446618E+00 0,68170733E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,12936282E+01 0,94599050E+00 0,93652889E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,18485616E+02	0,30791657E+01
2	0,41670000E+02	0,20898518E+02	0,18520906E+02
3	0,41660000E+02	0,10615866E+02	0,26399927E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

13966

.PROBLEM NO,
TIME = 3,2000LIQUID MOLE FRACTIONS LISTED AS COMPONENTS PER PLATE

BOTTOM PRODUCT
0,36606158E+00 0,42020578E+00 0,21373264E+00

PLATE NO, = 1
0,24259231E+00 0,45037901E+00 0,30702858E+00

PLATE NO, = 2
0,18129320E+00 0,44182591E+00 0,37688090E+00

PLATE NO, = 3
0,12906614E+00 0,42888309E+00 0,44205077E+00

REFLUX
0,60599541E+01 0,37049461E+00 0,56890585E+00

TOP PRODUCT
0,60599541E+01 0,37049461E+00 0,56890585E+00

BOTTOM PRODUCT RECOVERY FRACTIONS
0,10979651E+01 0,50420660E+00 0,25652021E+00

TOP PRODUCT RECOVERY FRACTIONS
0,18176227E+00 0,44455797E+00 0,68279626E+00

SUMS OF RECOVERY FRACTIONS, SHOULD EQUAL 1,0 AT STEADY STATE
0,12797274E+01 0,94876457E+00 0,93931648E+00

MOLES OF FEED AND PRODUCTS

COMPONENT	FEED	BOTTOM PRODUCT	TOP PRODUCT
1	0,16670000E+02	0,18303079E+02	0,30299770E+01
2	0,41670000E+02	0,21010289E+02	0,18524731E+02
3	0,41660000E+02	0,10686632E+02	0,28445292E+02
	0,10000000E+03	0,50000000E+02	0,50000000E+02

PLATE VARIABLES

SUMMATIONS	TEMPERATURES	VAPOR FLOWS	LIQUID FLOWS	VAP MOL ENTHALPY	LIQ MOL ENTHALPY
0,10000000E+01	0,10000000E+01	0,50000000E+02	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,15000000E+03		
0,10000000E+01	0,10000000E+01	0,10000000E+03	0,50000000E+02		

38552


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